

# GEORGE ENGELMANN BOTANICAL NOTEBOOKS

*Pagination Note:  
Since many of the items lack a specific  
page number, the page number displayed  
online refers to the sequentially created  
number each item was given upon  
cataloging the materials.*

*J. Euzelminium*  
var. *Veloid*

123-134

identical with, *P. acuta*, Hall. It has the same form and arrangement of the cells, with the exception of the cells being as large on the outside as on the middle rows. It differs, moreover, in the edges of the branches not being acute but rounded, but above all by the existence of a central lamella or plate which separates the opposite and less flattened portions of the bryozoan.

Geol. Pos. & Loc.—Upper Silurian, Columbus, Ohio.—  
[Illinois State Collection.]

macrospore 0.40

Canby  $\frac{21}{9}$  0.32 - 0.47

Java  $\frac{25}{9}$  0.41 - 0.48  
0.40 - 0.45  
0.39 - 0.46  
0.38 - 0.47  
Porter " 0.37 - 0.43  
Canby Nov. 0.40 - 0.49

microspore 0.026

Canby  $\frac{21}{9}$  0.025 - 0.027

Java "  $\frac{25}{9}$  0.024 - 0.027  
0.023 - 0.027  
0.0251 - 0.027  
0.024 - 0.027  
Porter " 0.024 - 0.029  
Canby Nov 0.027 - 0.031



0  
cm

1 2 3 4 5 6 7 8 9 10

copyright reserved



MISSOURI  
BOTANICAL  
GARDEN

13810

	JA	FE	MA	AP	M	J	J	SE	O	NO	DE	
1861...	32.2	40.4	44.8	58.1	64.1	76.9	77.5	78.6	69.1	57.9	46.0	39.7
1862...	28.9	30.2	43.2	55.0	69.7	75.1	81.2	80.7	72.1	57.3	42.6	41.3
1863...	36.8	35.7	43.6	57.4	65.5	71.9	77.2	77.5	69.2	48.0	43.7	35.9
1864...	29.2	38.3	40.7	51.4	69.4	78.9	83.5	78.8	72.9	53.1	44.9	30.4
1865...	28.1	38.4	46.7	56.8	68.8	80.7	77.7	78.1	77.8	58.8	48.0	30.8
Mean	31.0	36.6	43.8	55.7	67.5	76.7	79.4	78.7	72.2	57.0	45.0	35.6
												56.4

## RELATIVE HUMIDITY.

1861...	72.2	63.3	64.5	61.5	66.3	70.8	66.3	69.6	77.3	76.6	69.0	74.3	69.5
1862...	85.3	73.9	70.8	67.0	57.3	67.0	66.8	64.3	74.2	67.2	69.5	74.6	69.8
1863...	79.2	81.7	68.1	57.2	59.4	67.7	68.6	70.7	68.2	74.4	67.4	79.5	70.2
1864...	75.6	62.7	70.0	69.8	56.4	61.5	62.8	69.0	64.1	67.9	74.2	75.5	67.4
1865...	74.6	72.0	66.1	66.8	62.1	67.9	77.4	71.7	76.8	74.1	62.3	78.8	70.9
Mean	77.4	70.7	67.9	64.5	60.3	67.0	68.4	69.1	72.1	72.0	68.5	76.5	69.6



0 1 2 3 4 5 6 7 8 9 10  
cm

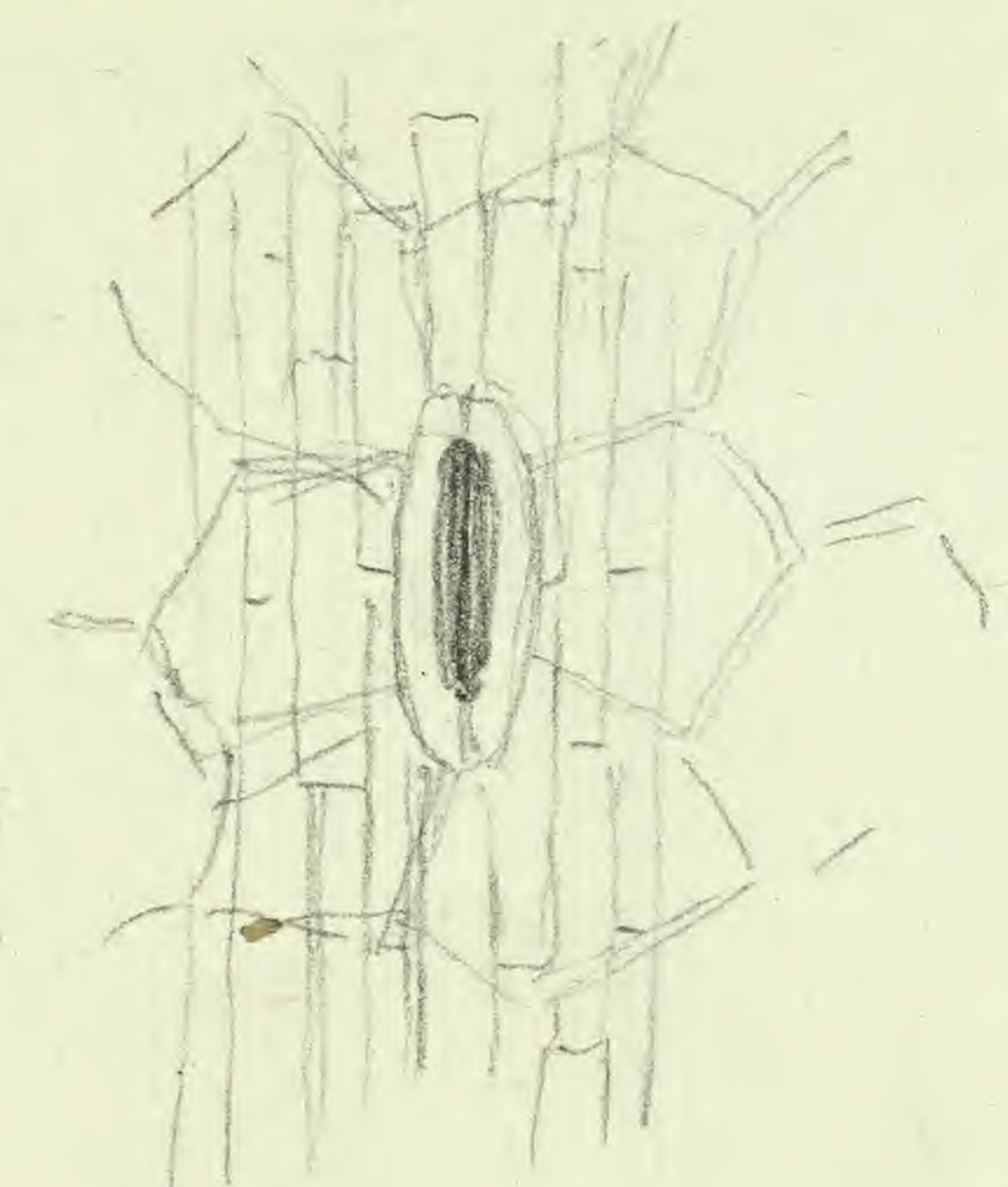
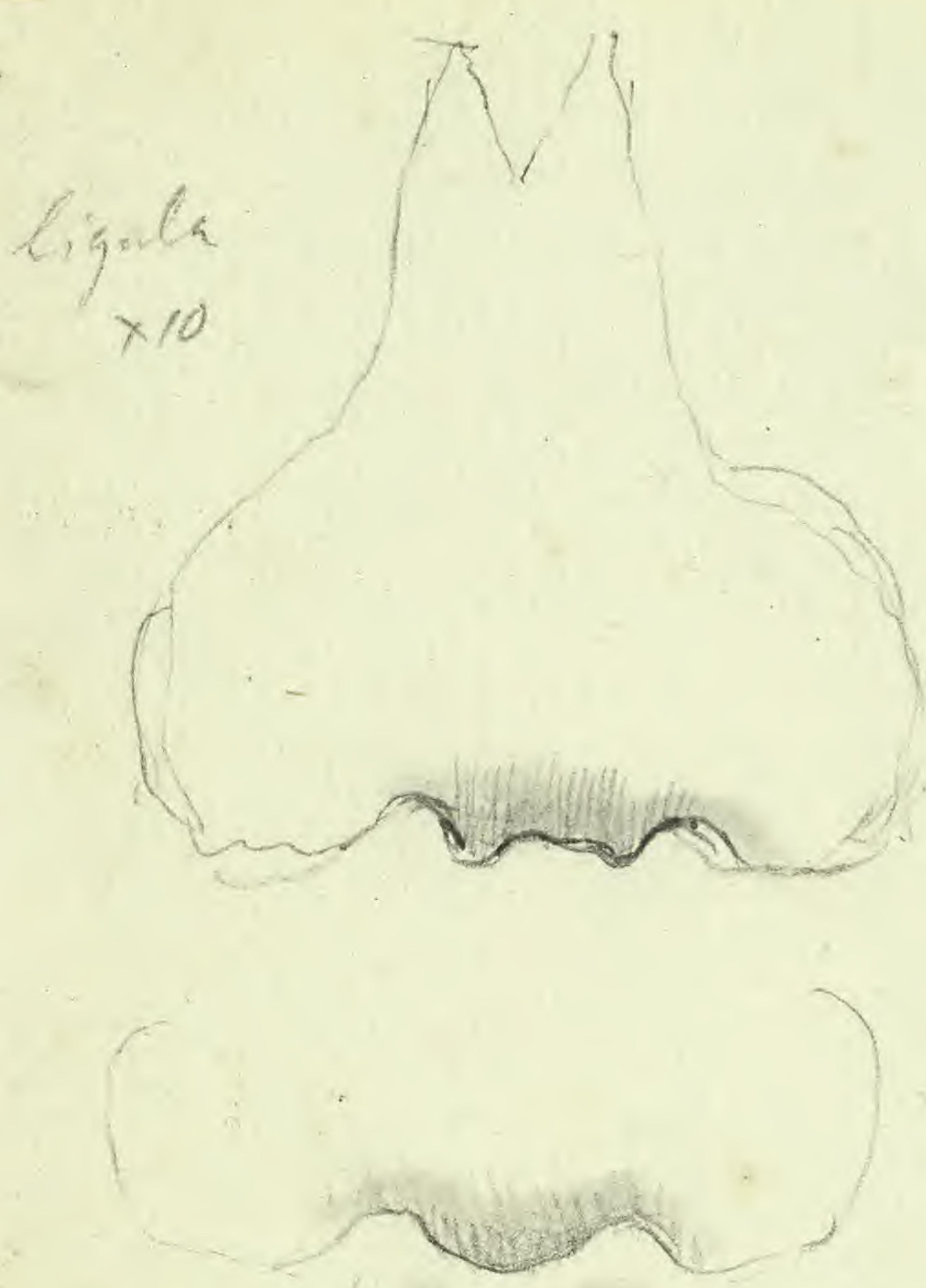
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MISSOURI  
BOTANICAL  
GARDEN

Isotria No 1 valida  
Delaware

June 20 1866

Canby June 16



large plant with  
long velum

No 1 is the larger plant  
with long velum, very  
flat lobed bulb which  
seems possible perhaps  
3 years. Spores very  
small yet violet,  
not yet grown.

Leaves strongly variate  
above, 40 or 50  
both forms with stomata



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

13811

ALEX. TENCH,  
APPARATE AND CUE MISS,

Marble Building, Cor. Fourth and Olive Streets,  
ST. LOUIS, MO.



0  
cm

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copyright reserved

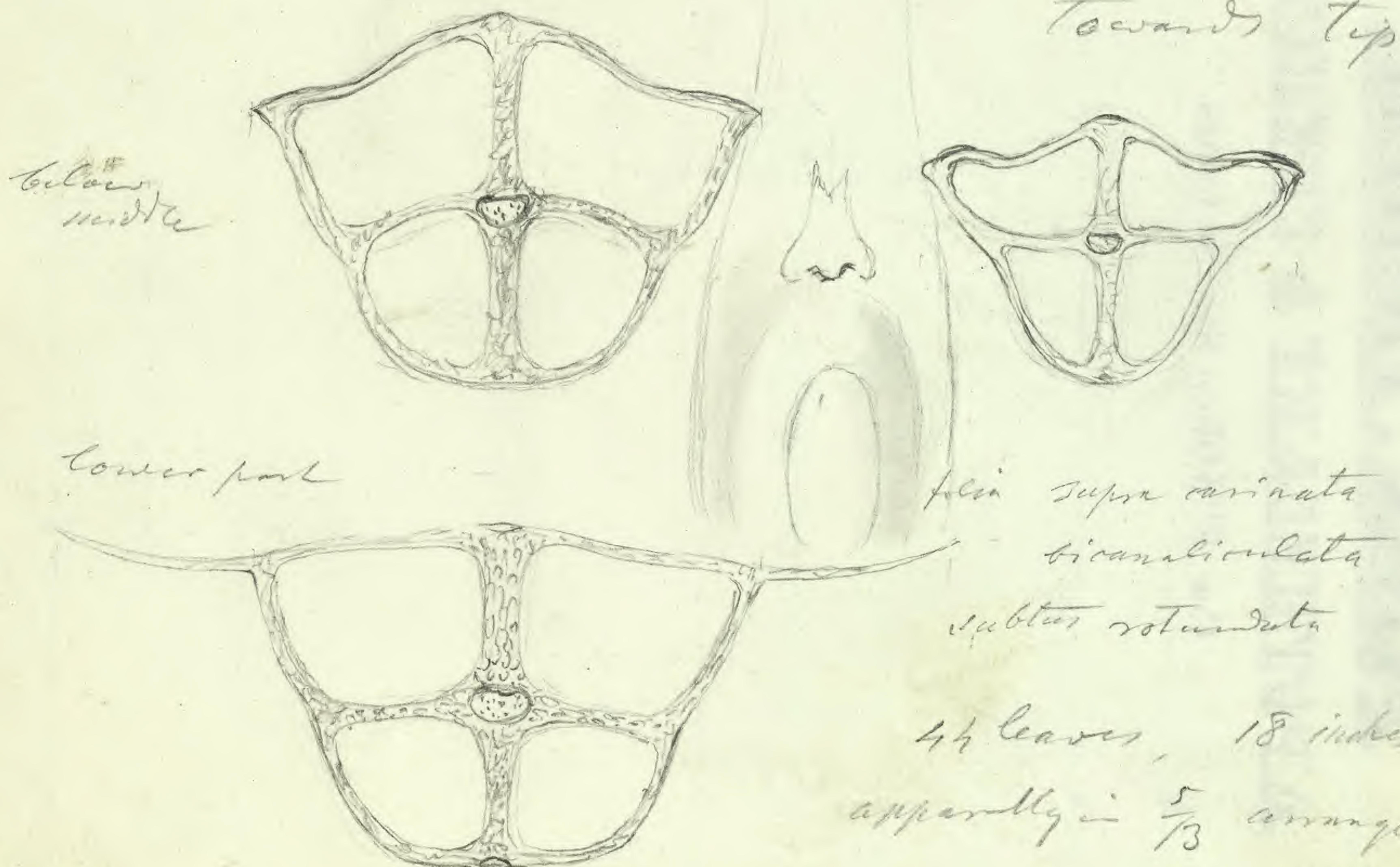


MISSOURI  
BOTANICAL  
GARDEN

*Isocetes* N. 1 *valida*  
Delaware, Canby  
part of leaf  $\times 10$

June 20 1866

base of leaf  
 $\times 2$



44 leaves, 18 inches long  
apparently in  $\frac{5}{3}$  arranged



0 1 2 3 4 5 6 7 8 9 10

cm

copyright reserved



MISSOURI  
BOTANICAL  
GARDEN

13812

ALEX. LEITCH,  
APOTHECARY & CHEMIST,  
Cor. 4<sup>th</sup> & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

Isacta No 1 valida

June 22 1866

Delaware, Caney Inn 16

horizontal sect x10

vertical sect x10

velum

ligula



0

1

2

3

4

5

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8

9

10

cm

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MISSOURI  
BOTANICAL  
GARDEN

13813

ALEX. LEITCH,

APPAREL CARRY AND CLOTHING,

Marble Building, cor. Fourth and Olive Streets,

ST. LOUIS, MO.



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

Isocladus N. 1 valid June 20 1866  
Delaware  
Canby June 16



root of bulb x 2

leaves 18" long, 40-45"



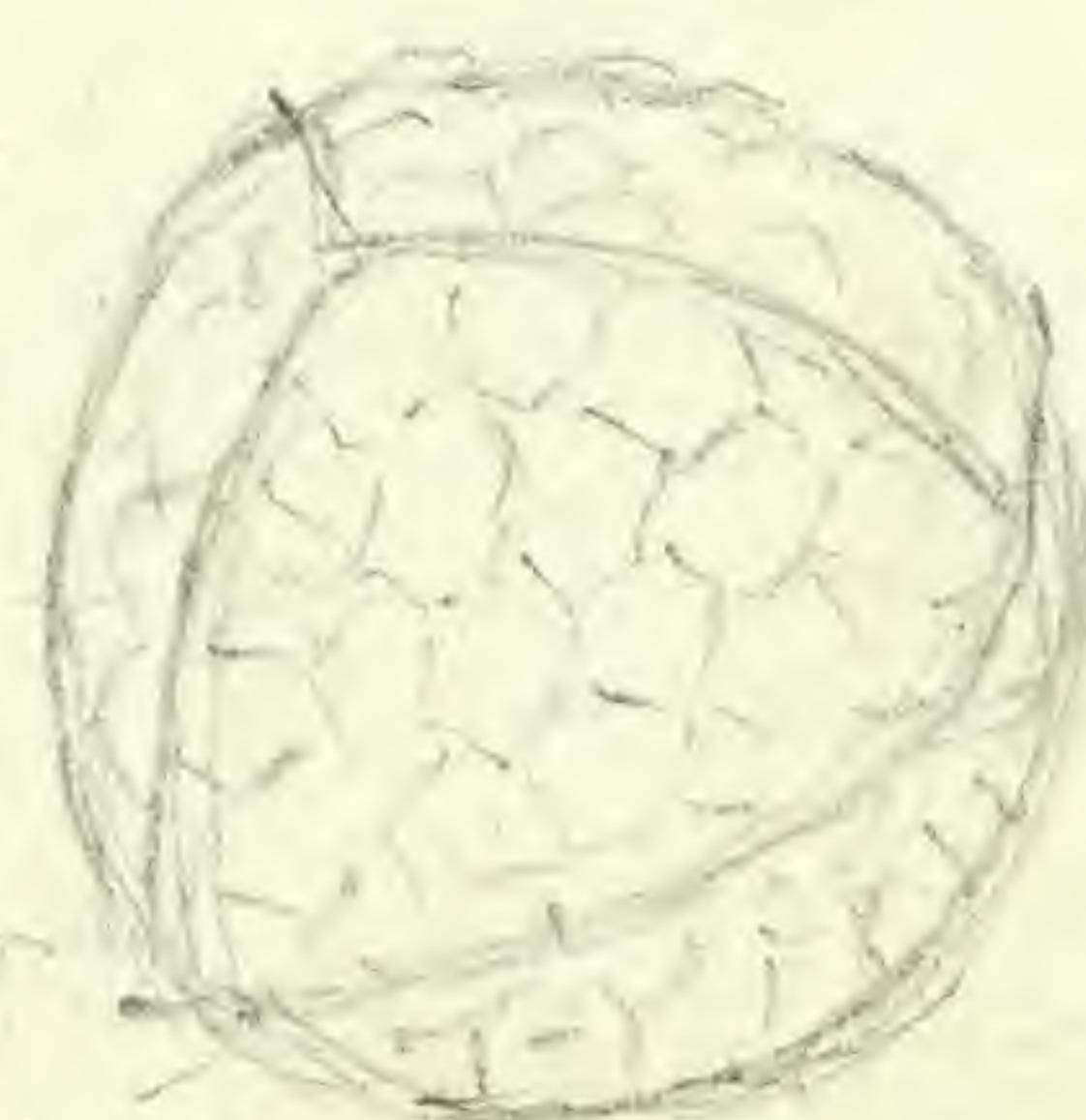
another bulb

horizontal sections  
of same x 2

upper



leaves 4 foot long



spores x 60

unripe

surface (apparently  
smooth, or) when dry,  
very finely reticulated



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL  
GARDEN

13814

**ALEX. LEITCH.**

**APOTHECARY & CHEMIST,**

Cor. 4<sup>th</sup> & Olive Sts., St. Louis.

1. is the bulb of this year
2. last year's growth
3. two years ago

at the end of this the bulb is  
truncate, probably where the helix  
of the bulb of three years ago has been  
thrown off.



0 cm

1

2

3

4

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7

8

9

10

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BOTANICAL  
GARDEN

*Isotoma validula*

Nov 20 1866

*foliis longissimi*

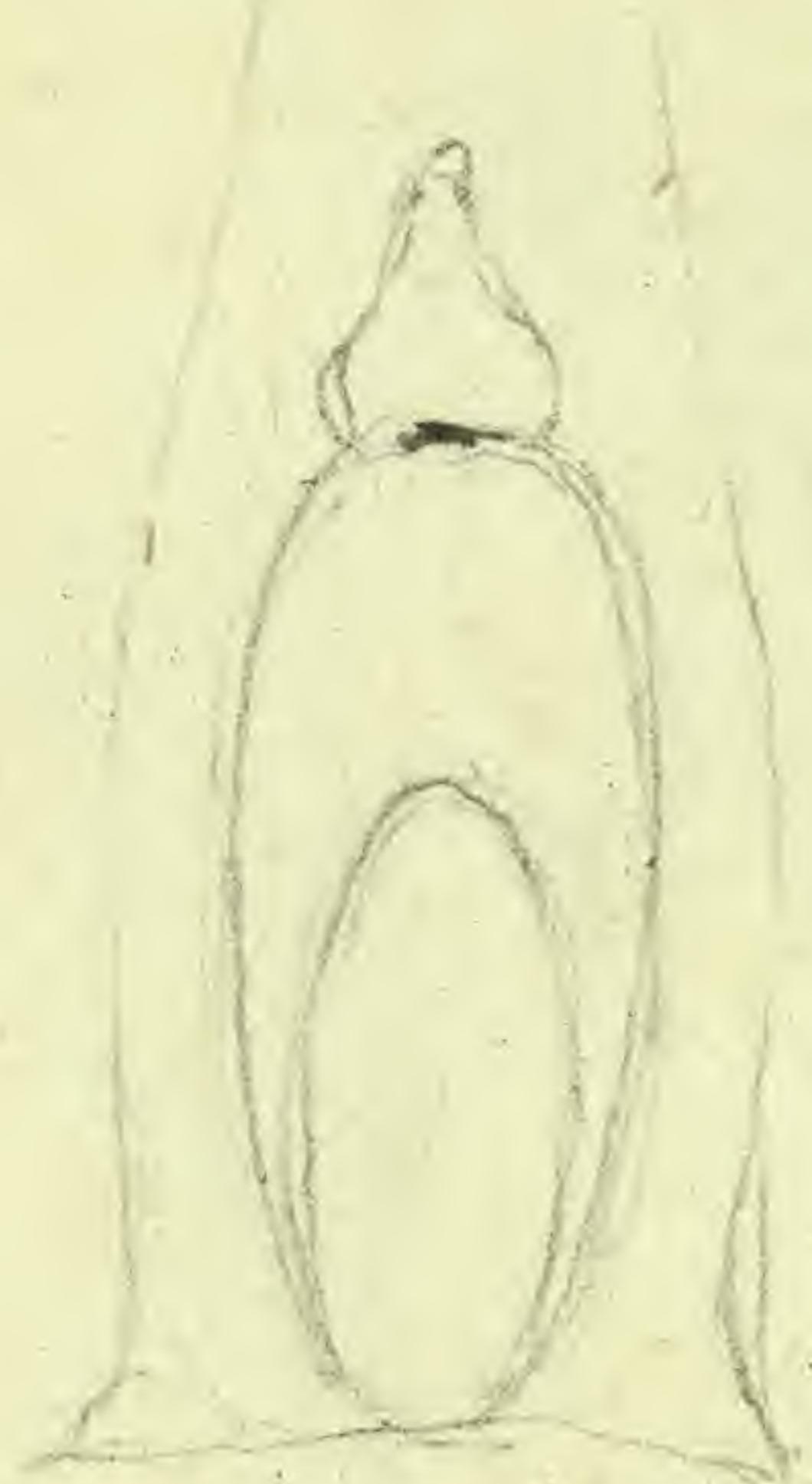
Diam of spores

$$\frac{24-29.5}{60} = 0.40-0.59$$



$$\frac{11-13}{415} = 0.027-0.031 \text{ mm}$$

$\times 2$



Woonsocket County

leaves 35-40

22-26 inches long



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL  
GARDEN

13815

**ALEX. LEITCH,  
APOTHECARY & PHARMACEUTIST.**

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



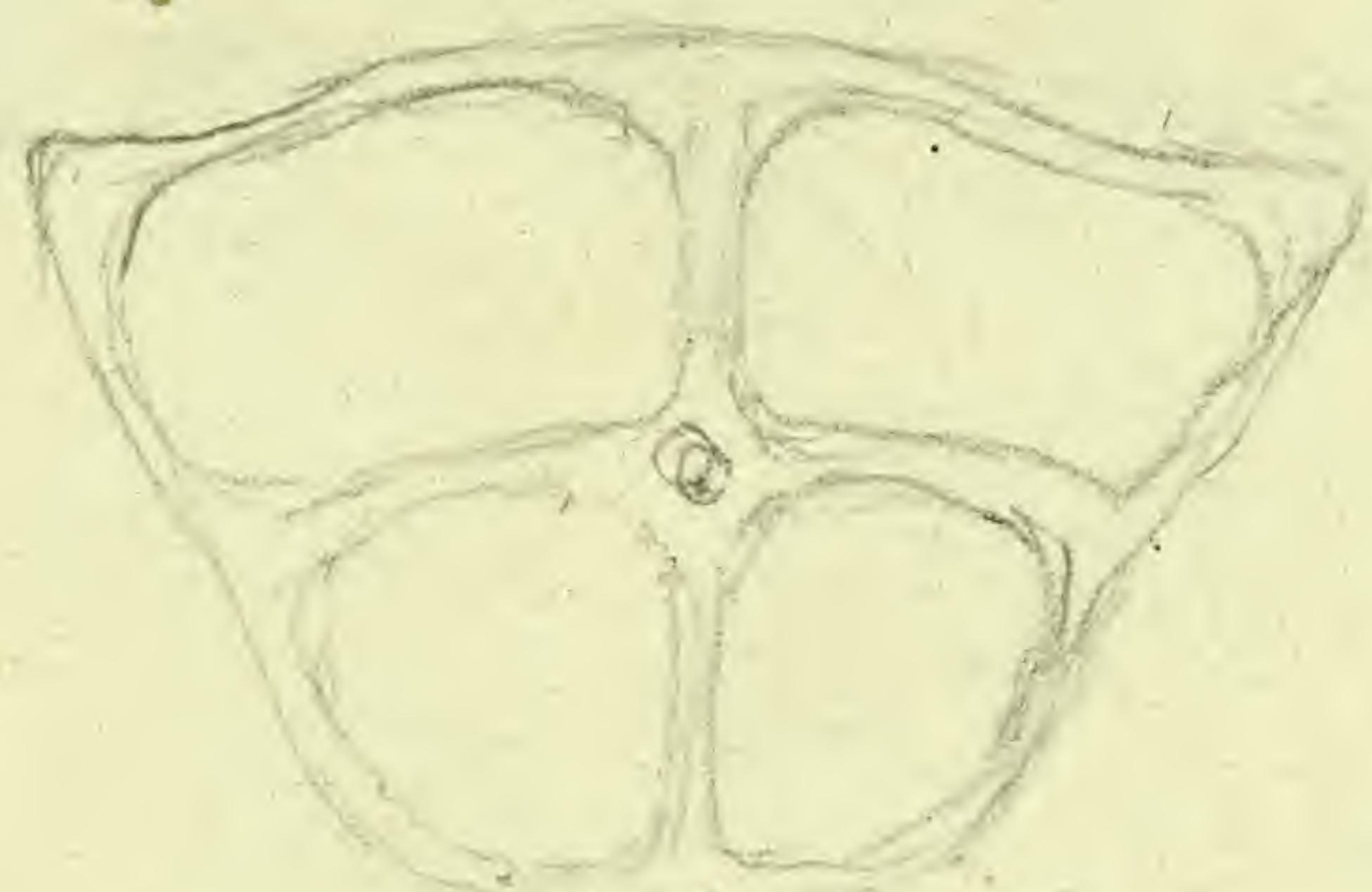
0 1 2 3 4 5 6 7 8 9 10  
cm

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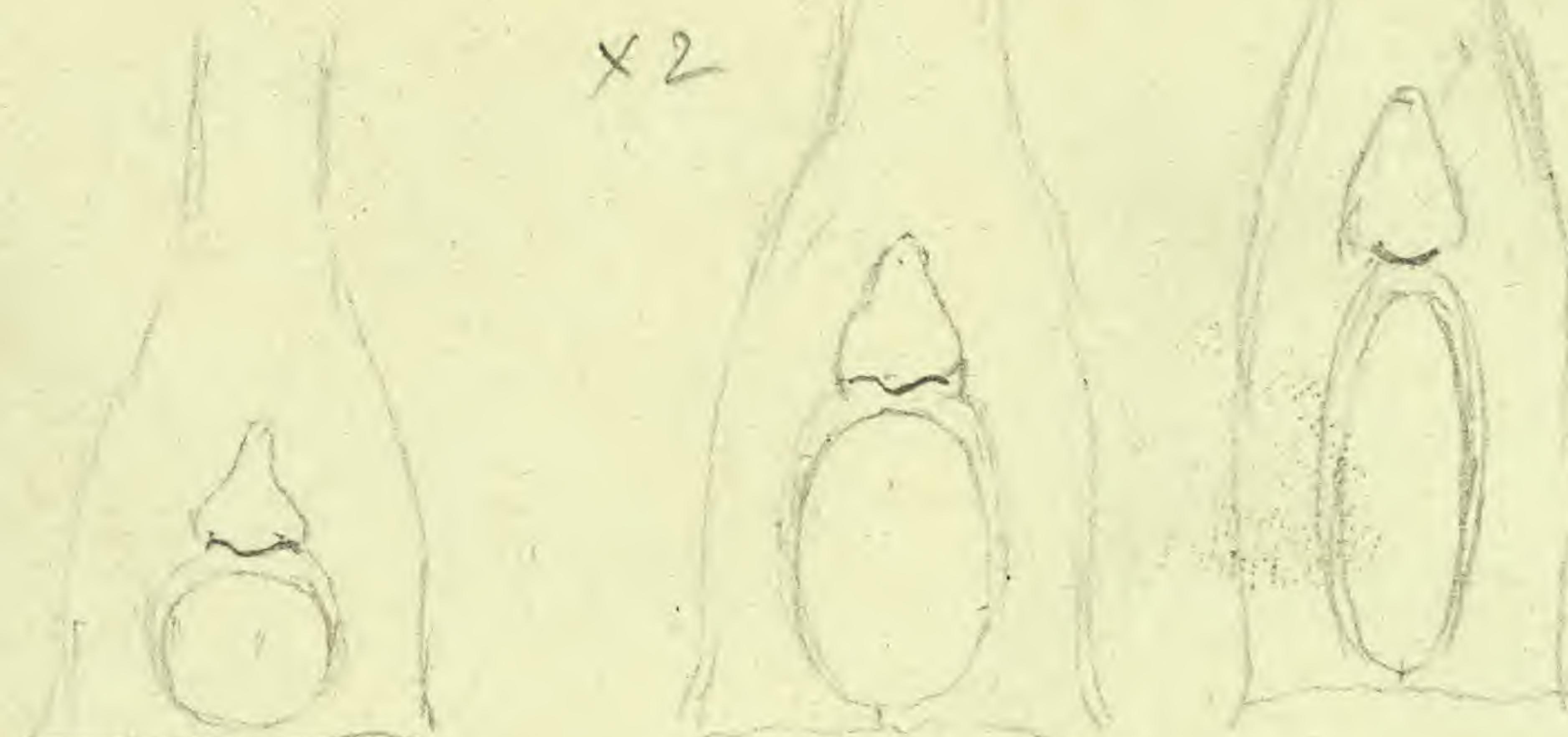


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BOTANICAL  
GARDEN

*Zoster validus* sp. Oct 2 1866  
scut x10  
Wilmington, Candy Sept 25 1866



x45  
0.028-0.027



x2



x2

15-20  
leaves 18-21  
indus 6

all macroscopic in  
bearing leaves - outer and  
inner

Diam of spores x60

= 24-27 mm

60

= 0.40-0.45

mostly 0.43 mm



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13816

ALEX. LETTCH.  
APPOTHECARY & CHARMAGEUTIST.

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0

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6

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8

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10

cm

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BOTANICAL  
GARDEN

*Isostoma veloida*  
pana.

Oct 6 3 1866

Canyon, W. County Sept 25 12-15 leaves  
18-20 inches

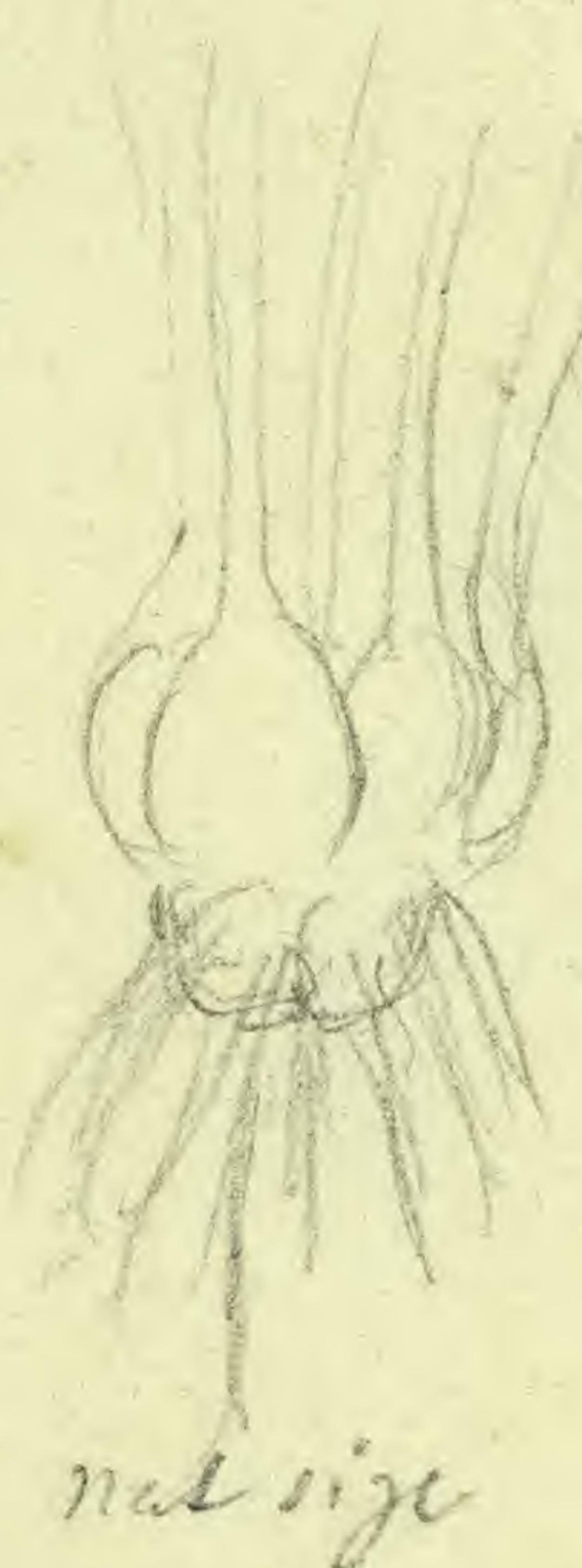
long

26.4 - 29

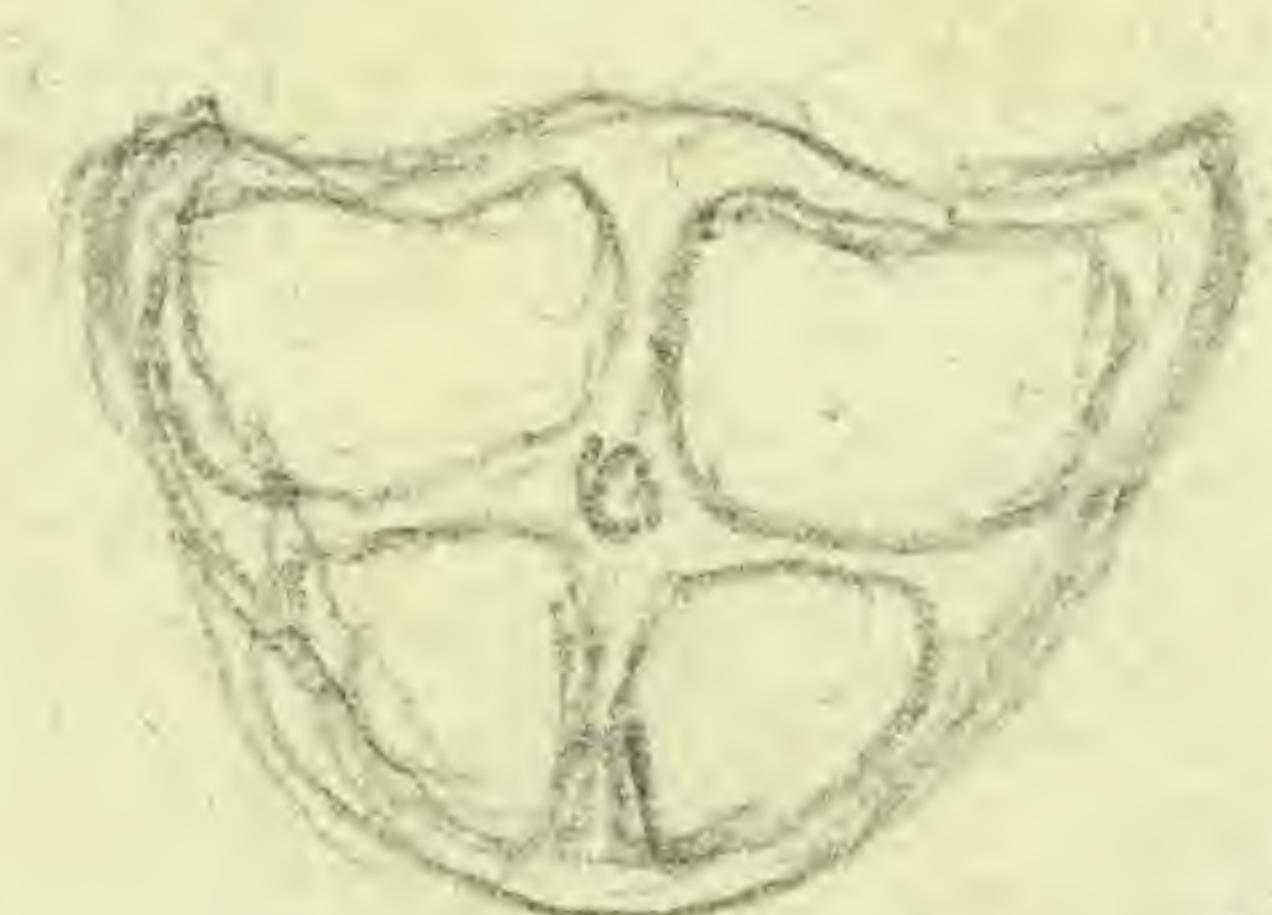
mm

6a.

= 0.41 - 0.48 mm

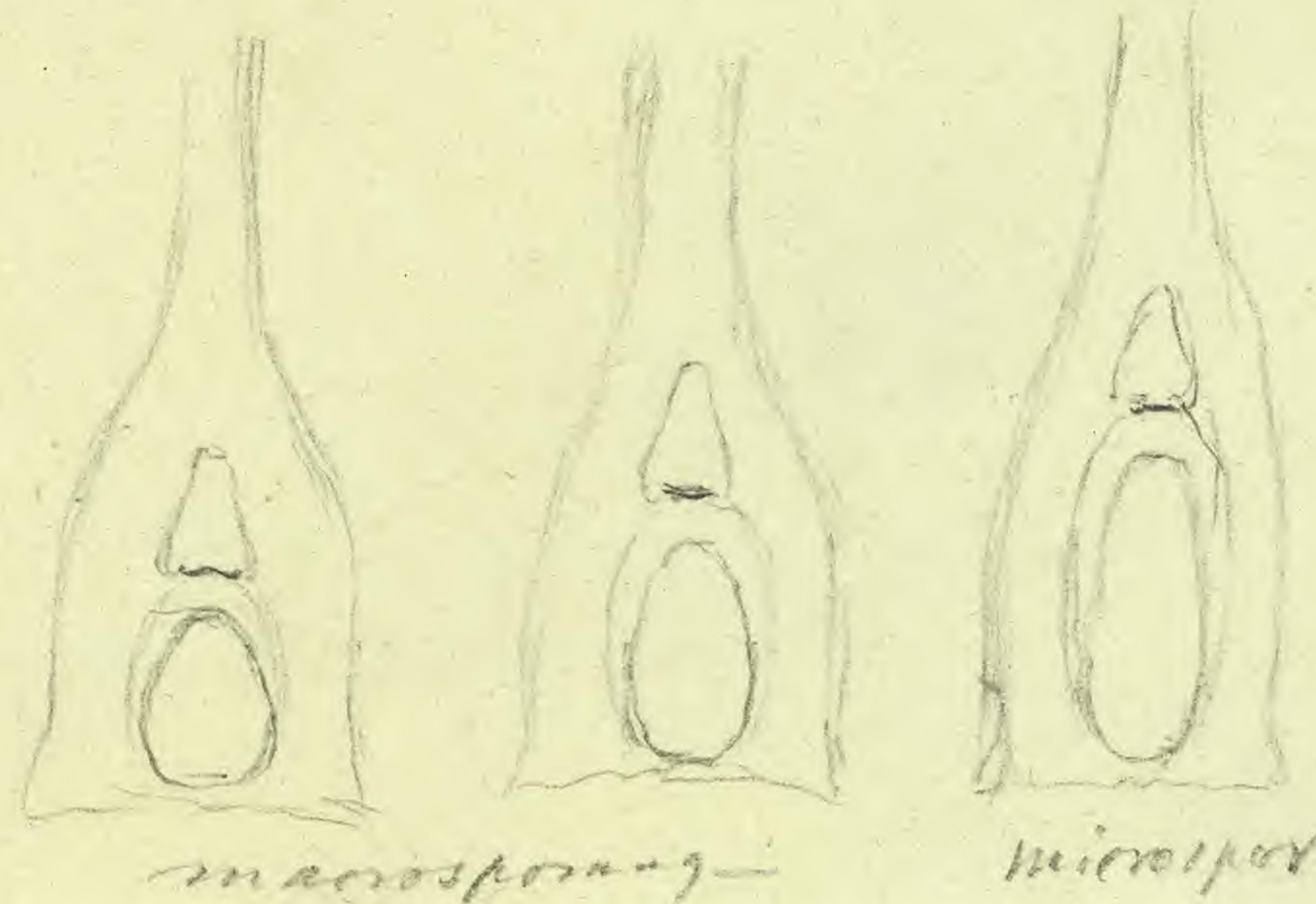


nat size



sort of leaf

x 10



macrosporang.

microspor.

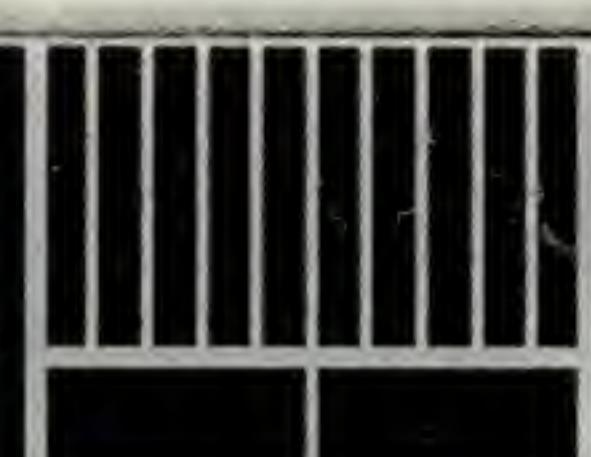


10-11  
mm

0.024 - 0.027

mm

Missouri Botanical Garden  
Collection No. 615



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13817

ALEX. LETCH,  
APOTHECARY & PHARMACEUTIST

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0 1 2 3 4 5 6 7 8 9 10

cm

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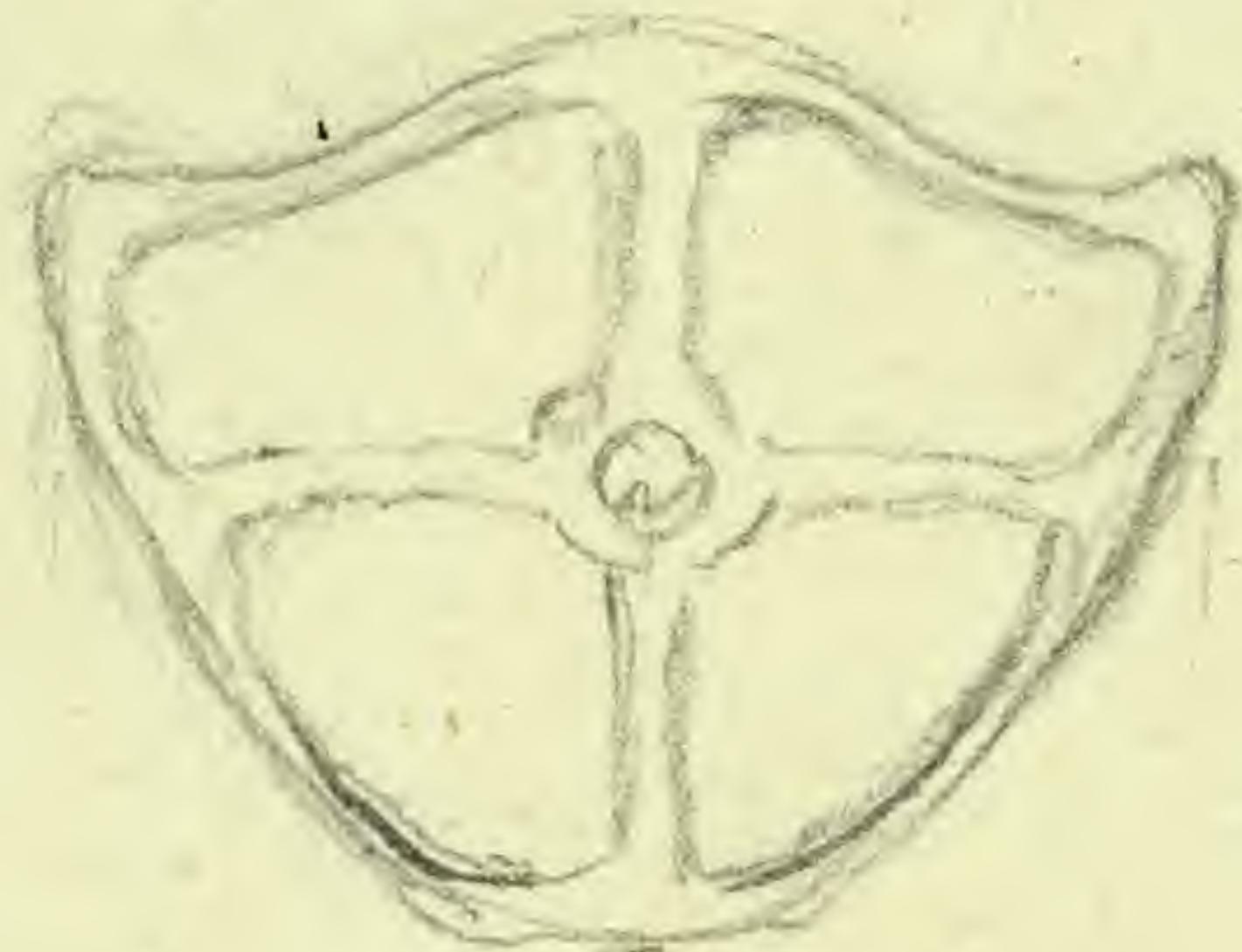
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GARDEN

*Isoetes validula* patron

Oct 3<sup>2</sup> 1866

Wilmington, Canby Sept 25 1866

seed of leaf x10



x2



$$\frac{10-11}{415} = 0.024$$

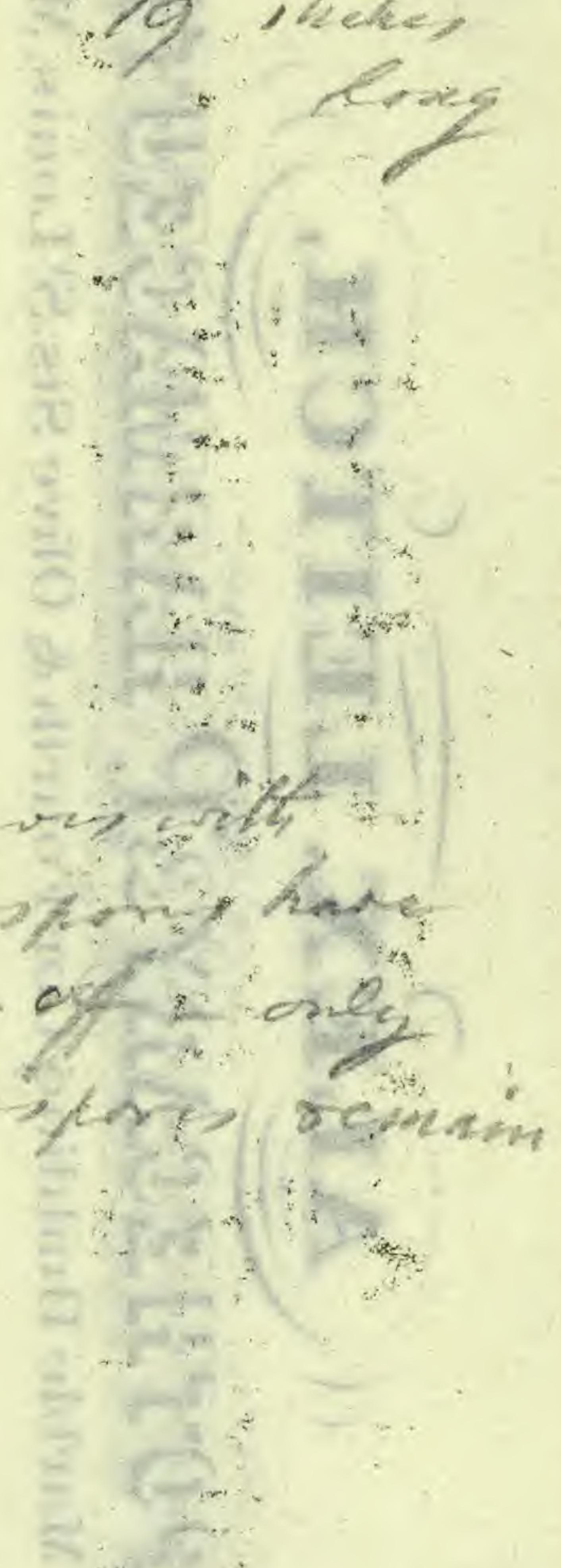
-0.027 mm



x2

18 leaves

19 inches  
long



all leaves with macrosporangia have  
fall off & only microsporangia remain

a very unusual form of frond



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

138/8

ALEX. LETTCH.  
APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

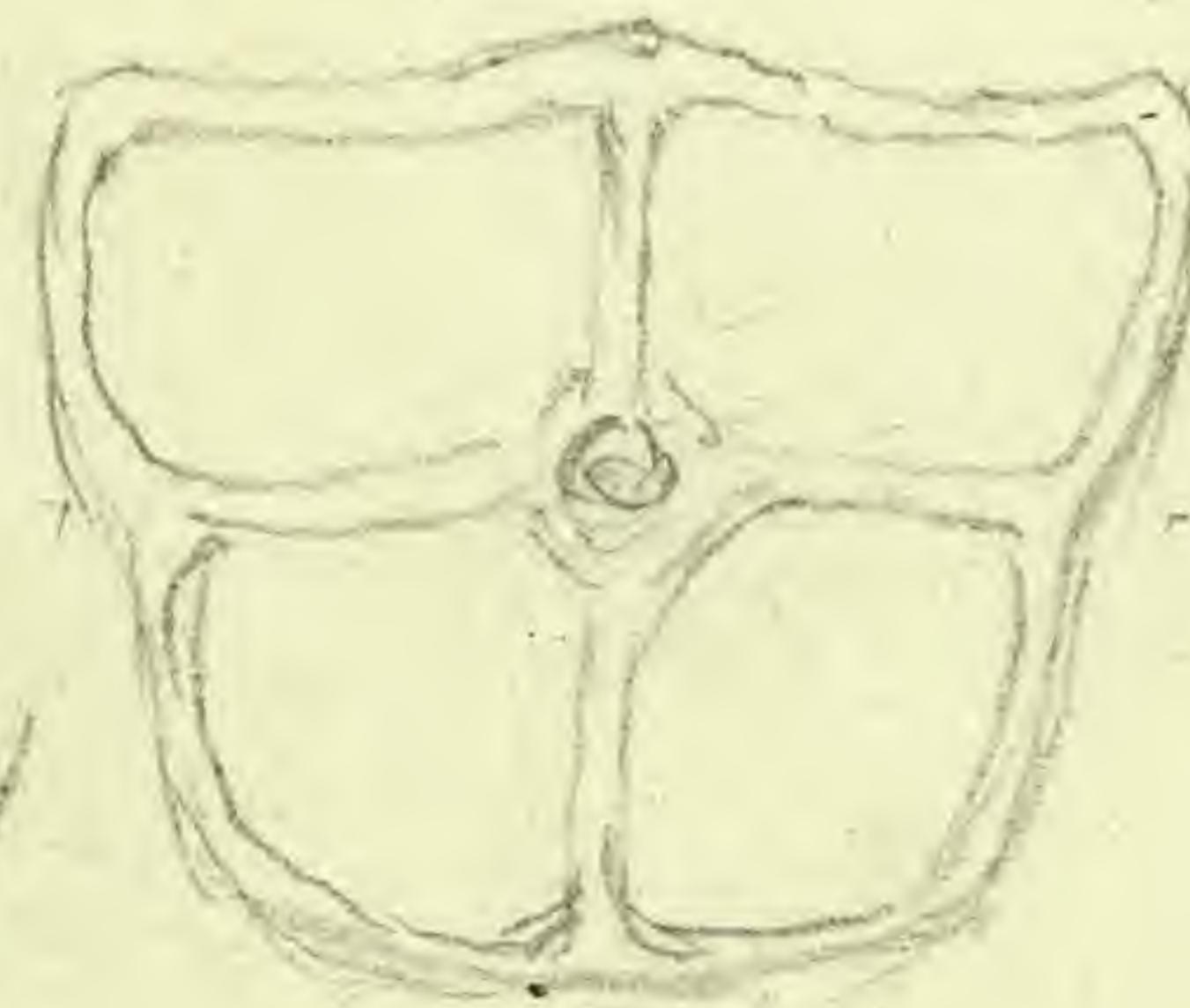
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MISSOURI  
BOTANICAL  
GARDEN

x10

vert  
through  
middle of  
leaf



Boettcheria?.

Oct 2 1866

Washington, D.C. Sept 25 1866

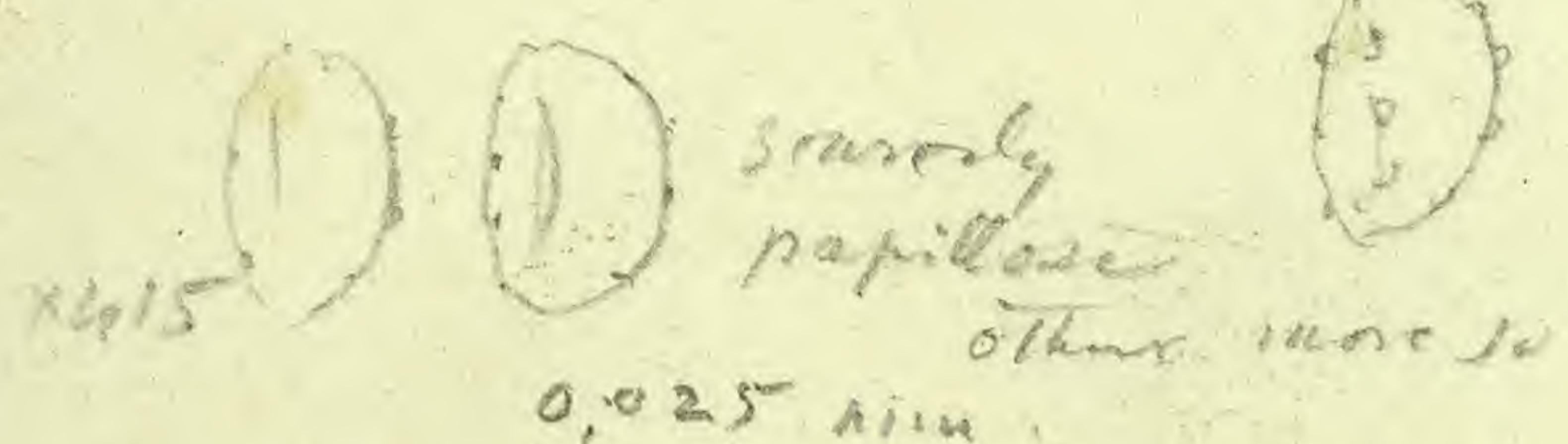
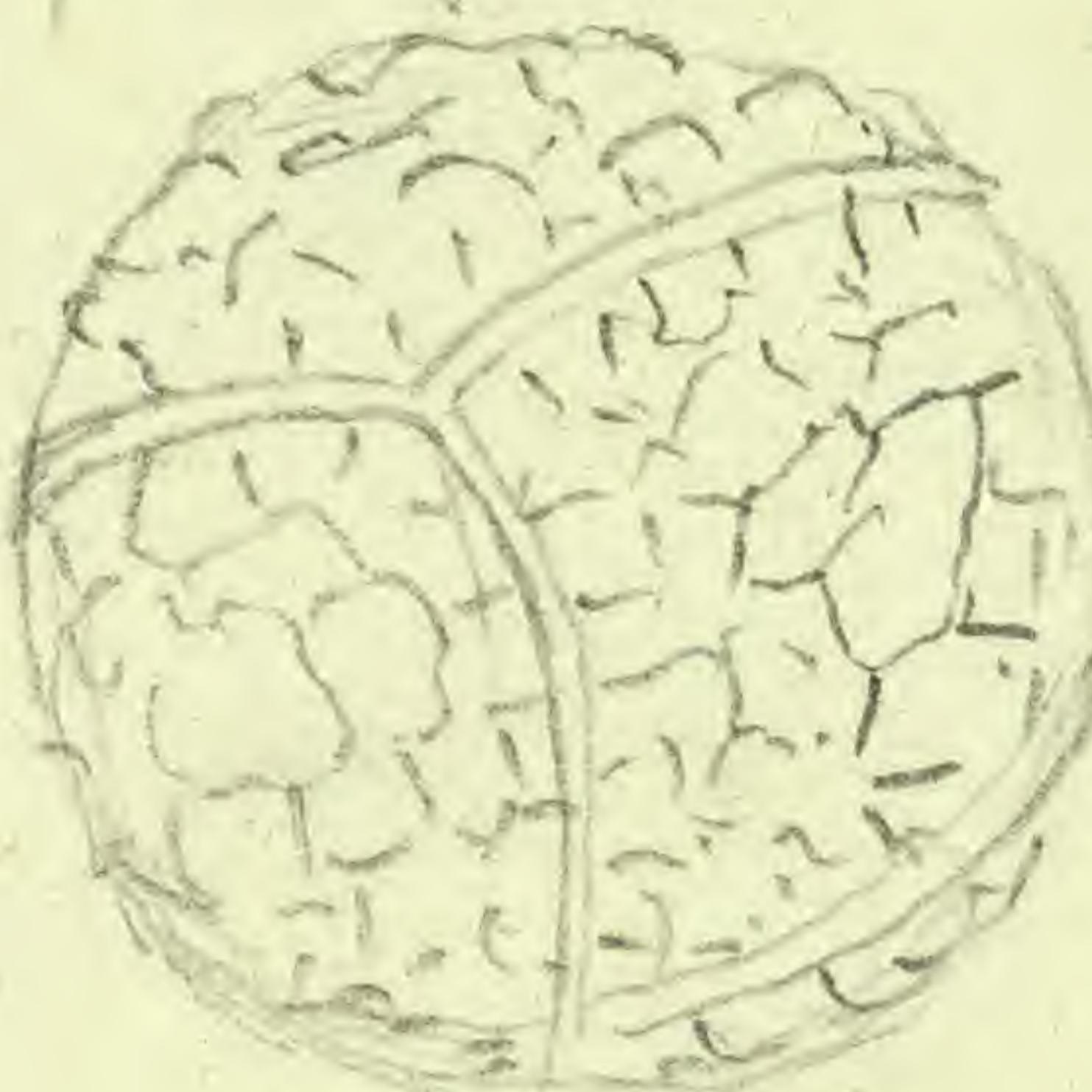
x2

leaves 12  
inches long

x 2



one of the exterior leaves  
with macrospore      inner leaf  
with macrospore



23.5 - 27.7 mm

60 -

= 0.39 - 0.46 mm  
mostly 0.43



0 1 2 3 4 5 6 7 8 9 10

cm

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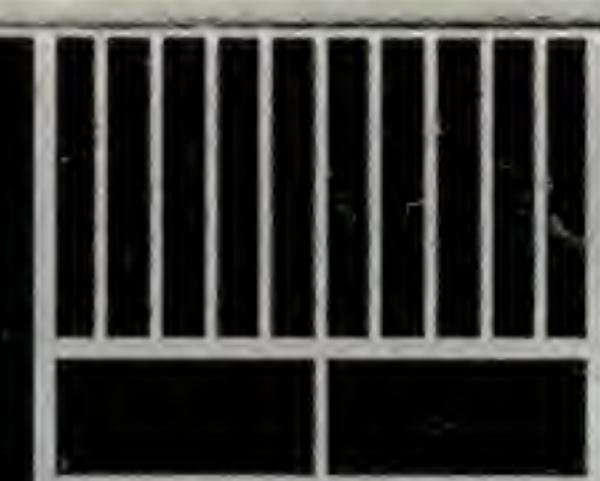


MISSOURI  
BOTANICAL  
GARDEN

13819

ALEX. LETCH.  
APOTHECARY & PHARMACEUTIST.

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL  
GARDEN

*Isotoma valide* ? Oct 2 1866

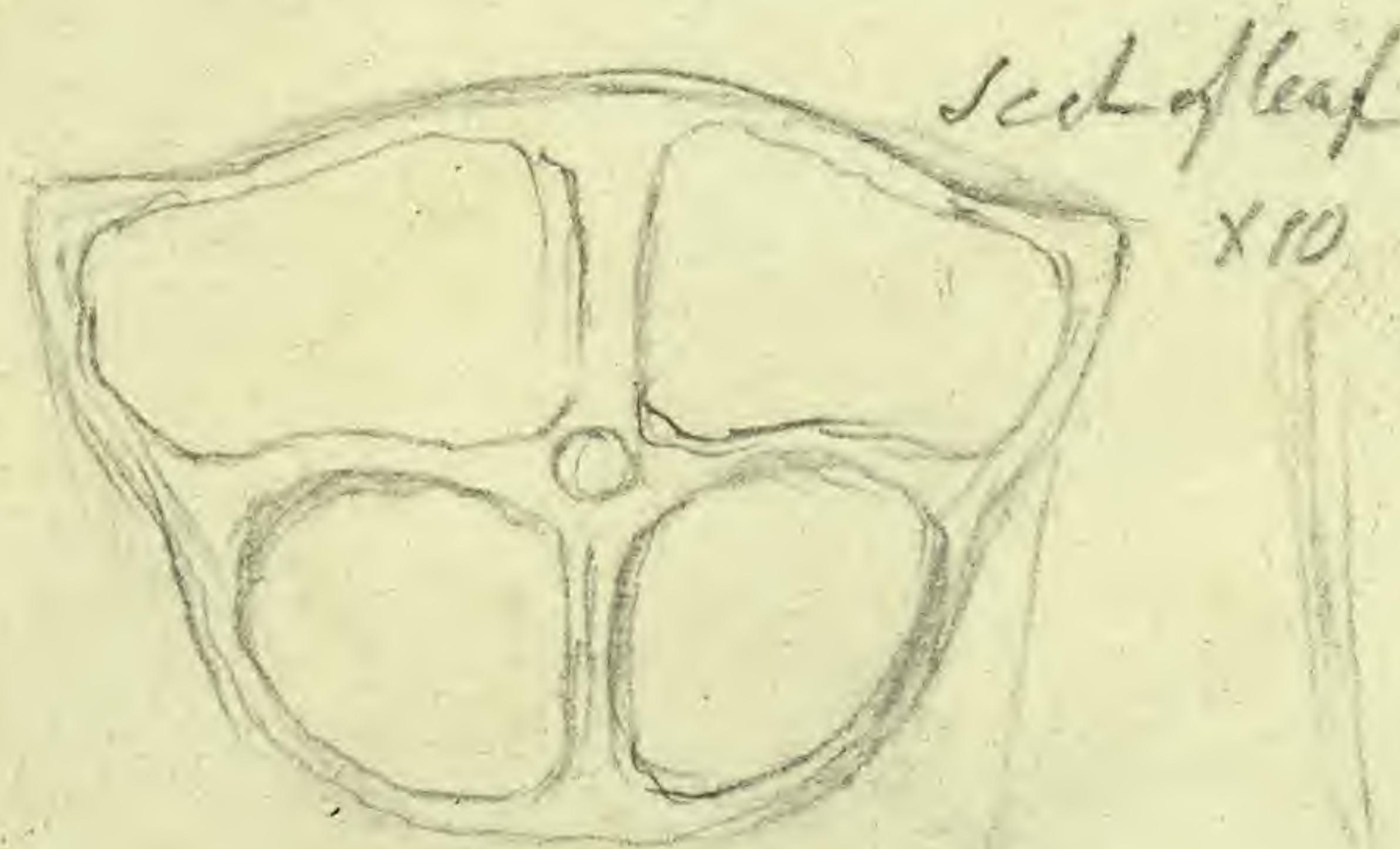
largest specimen of the lot

60-70 leaves, 20-21 inches long  
Wilmington, early Sept 25 1866

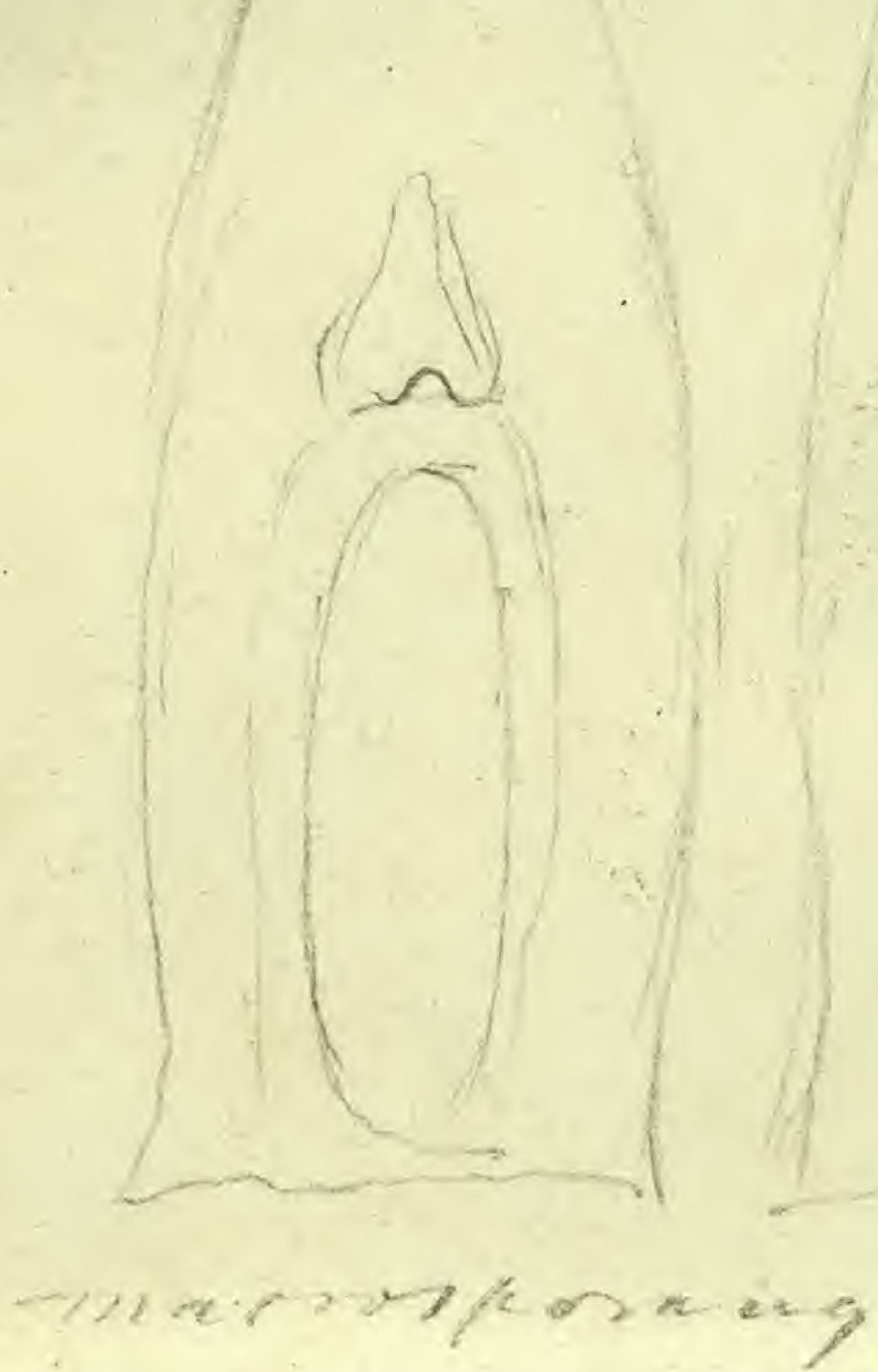


0.024-0.027

androsporangium x 415 - papillae



x2

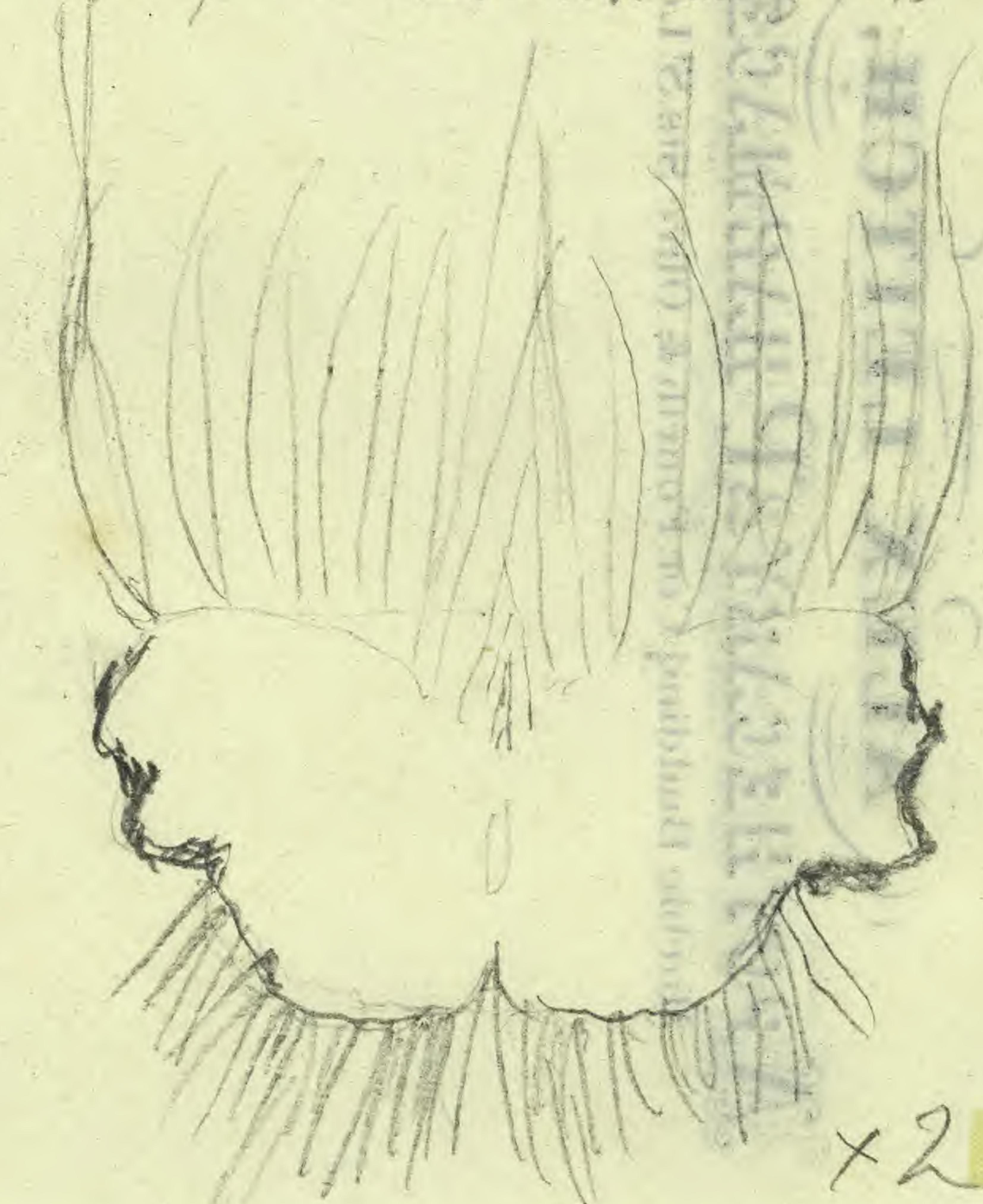


macrosporangia

diam of spores 0.38-0.47 mm 0.45

60

23-28 mm 27 mm



x2



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13820

ALEX. LEITCH,  
APOTHECARY & PHARMACEUTIST,  
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0  
cm

1 2 3 4 5 6 7 8 9 10

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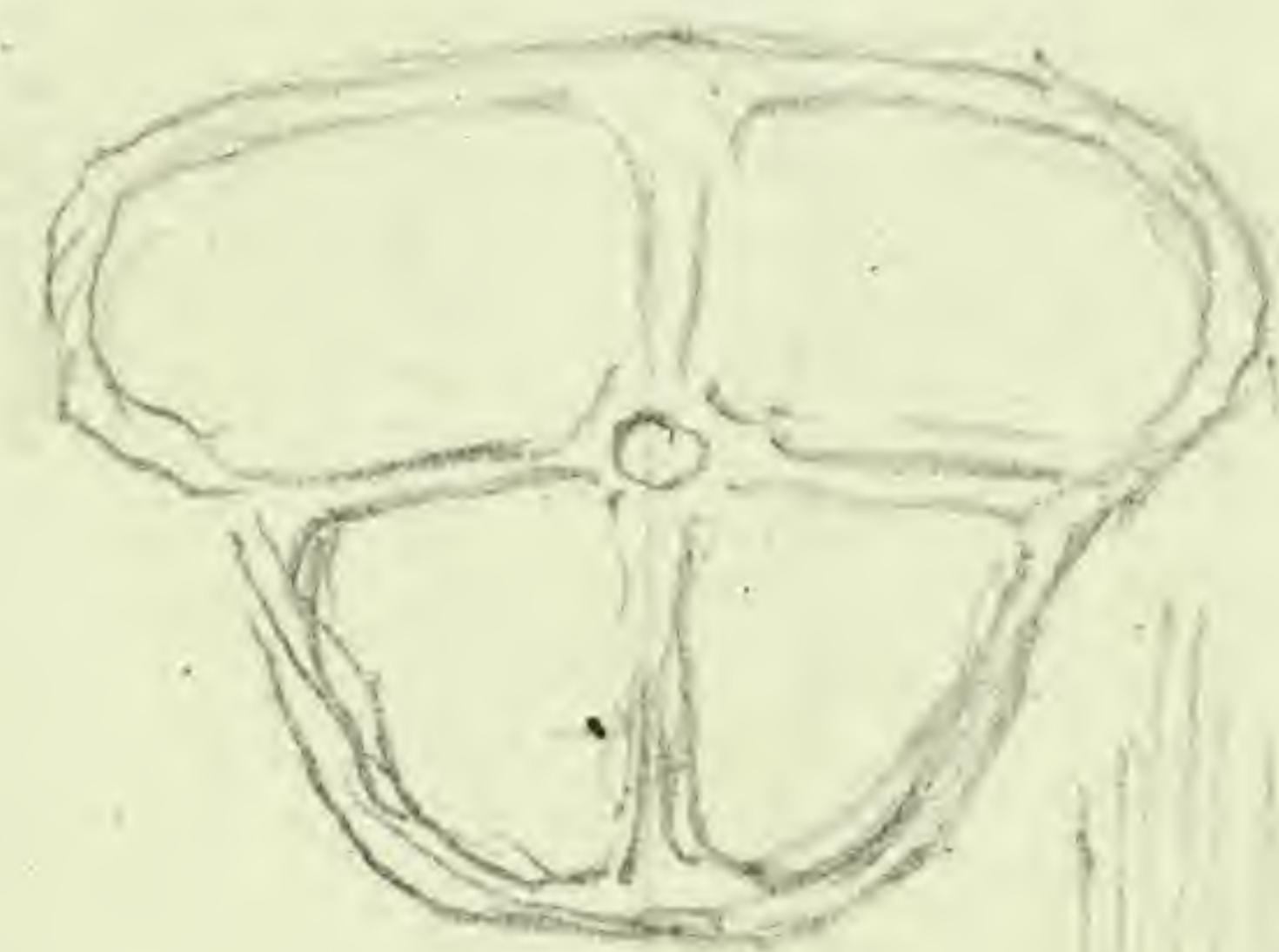
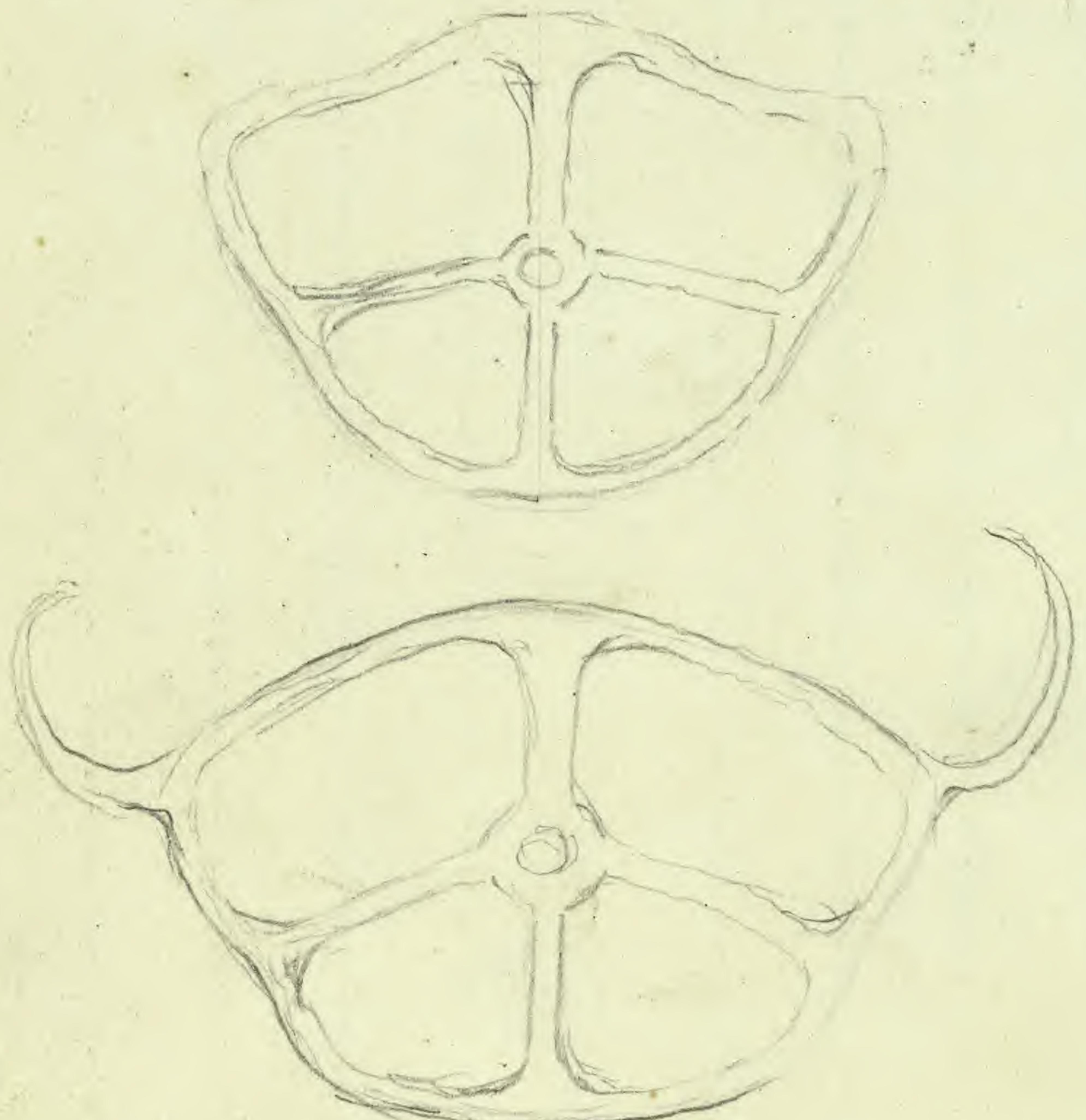


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GARDEN

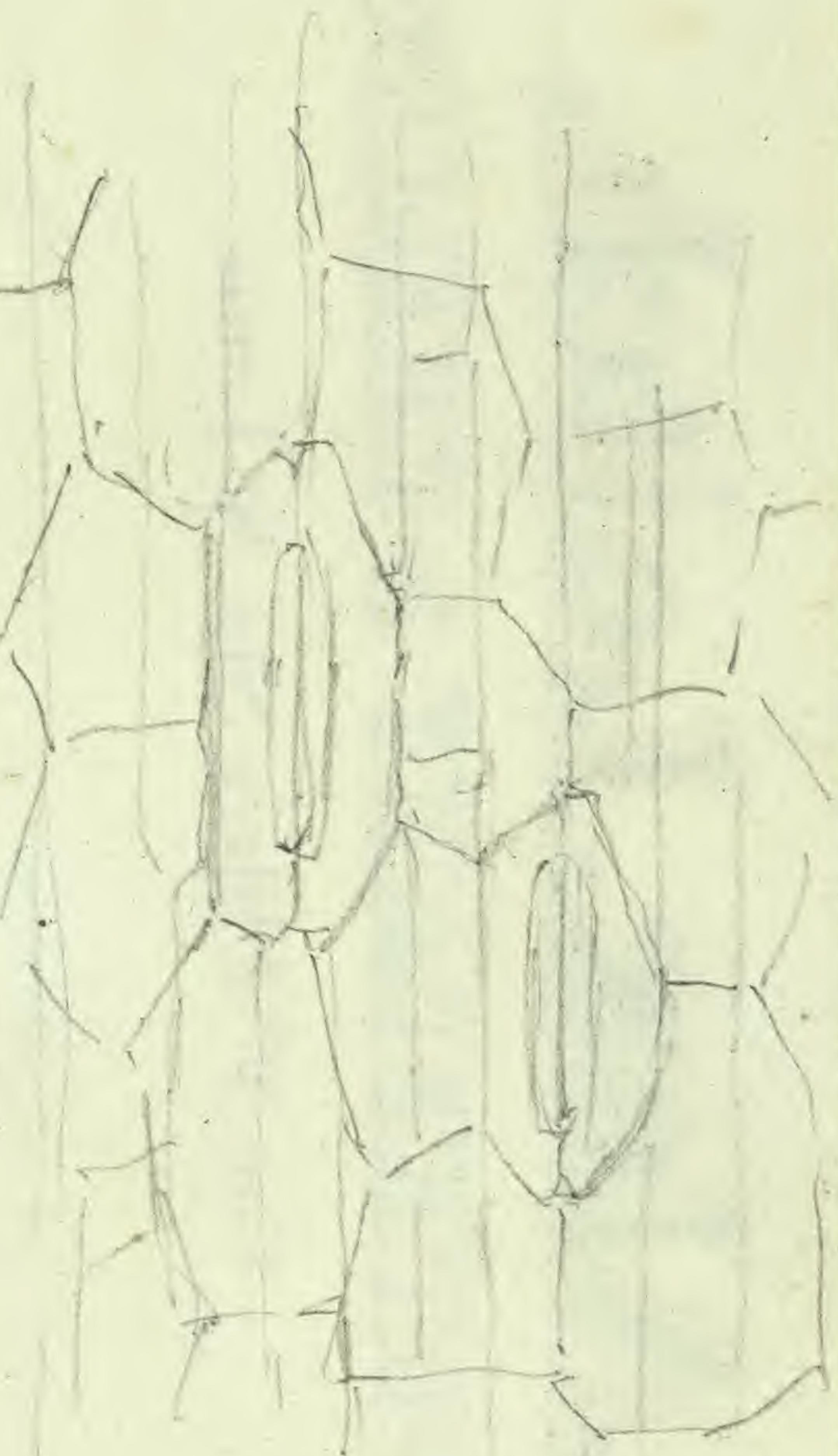
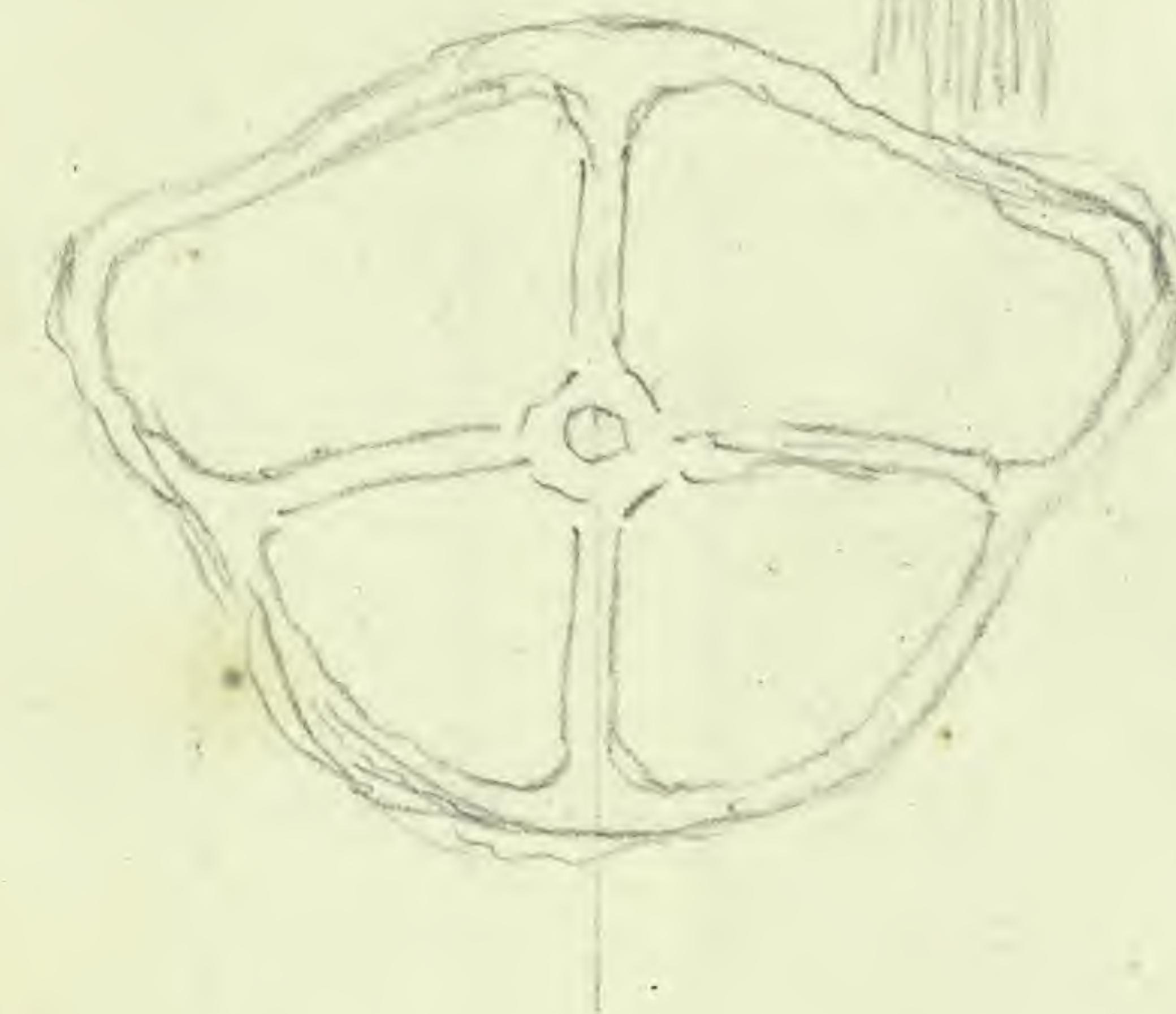
*Isocoma valida*  
Wilmington, Delaware, Canby, 21 Sept 1866  
seal of largest leaves x10

Sept 28 1866

leaves 18-22 in.



liber cells  
x280



0 1 2 3 4 5 6 7 8 9 10  
cm

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MISSOURI  
BOTANICAL  
GARDEN

13821

**ALEX. LEITCH,**

**APOTHECARY & CHEMIST,**

Cor. 4<sup>th</sup> & Olive Sts., St. Louis.



0

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cm

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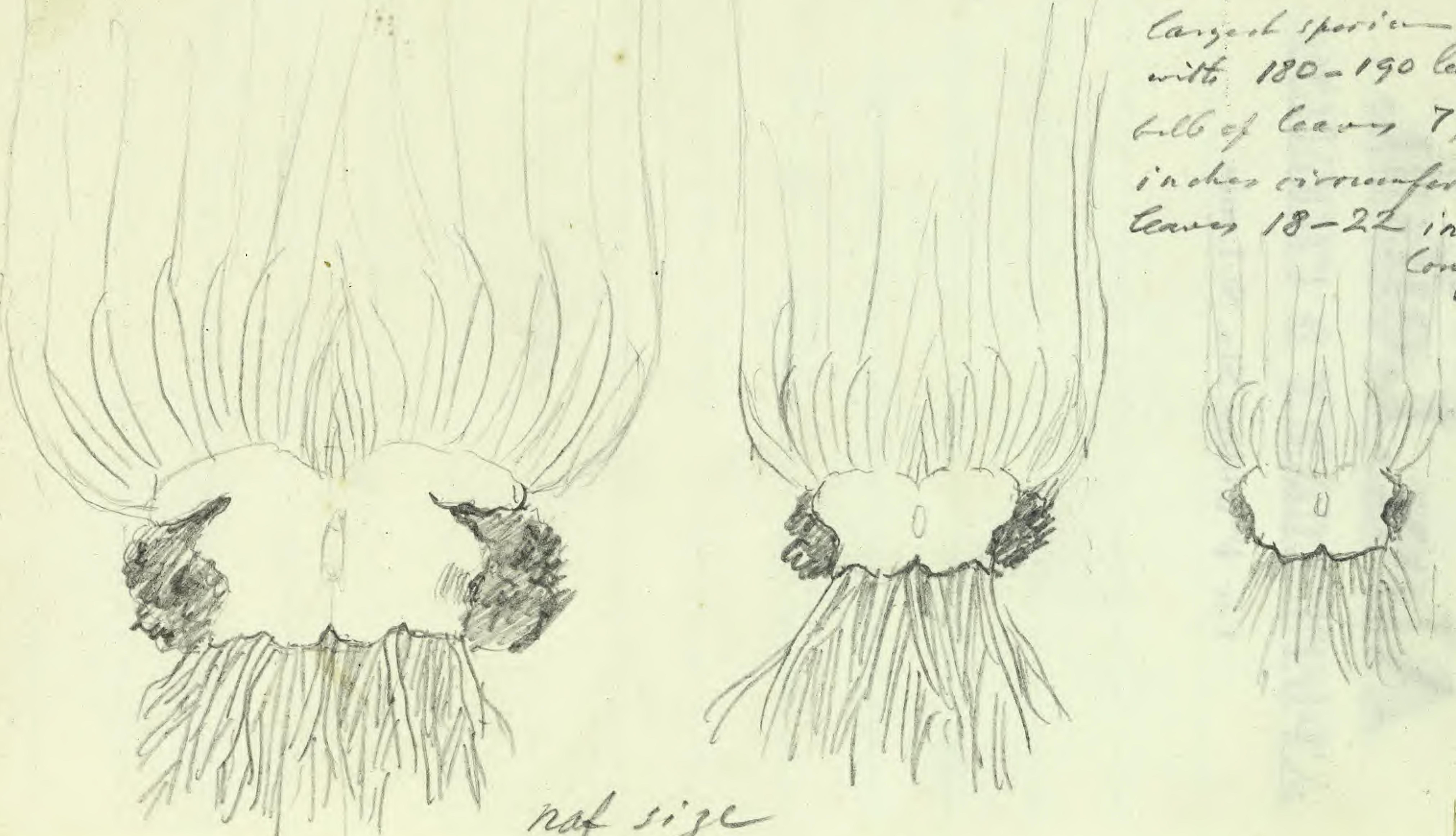
MISSOURI  
BOTANICAL  
GARDEN

*Isoetes valida*

Delaware Co. Sept 21 1866

Sept 28 1866

largest specimen  
with 180-190 leaves  
full of leaves  $7\frac{1}{2}$   
inches circumferent  
leaves 18-22 inches  
long



0  
cm

1

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BOTANICAL  
GARDEN

**Alex. Leitch**

**APOTHECARY & CHEMIST**

Cor. 4<sup>th</sup> & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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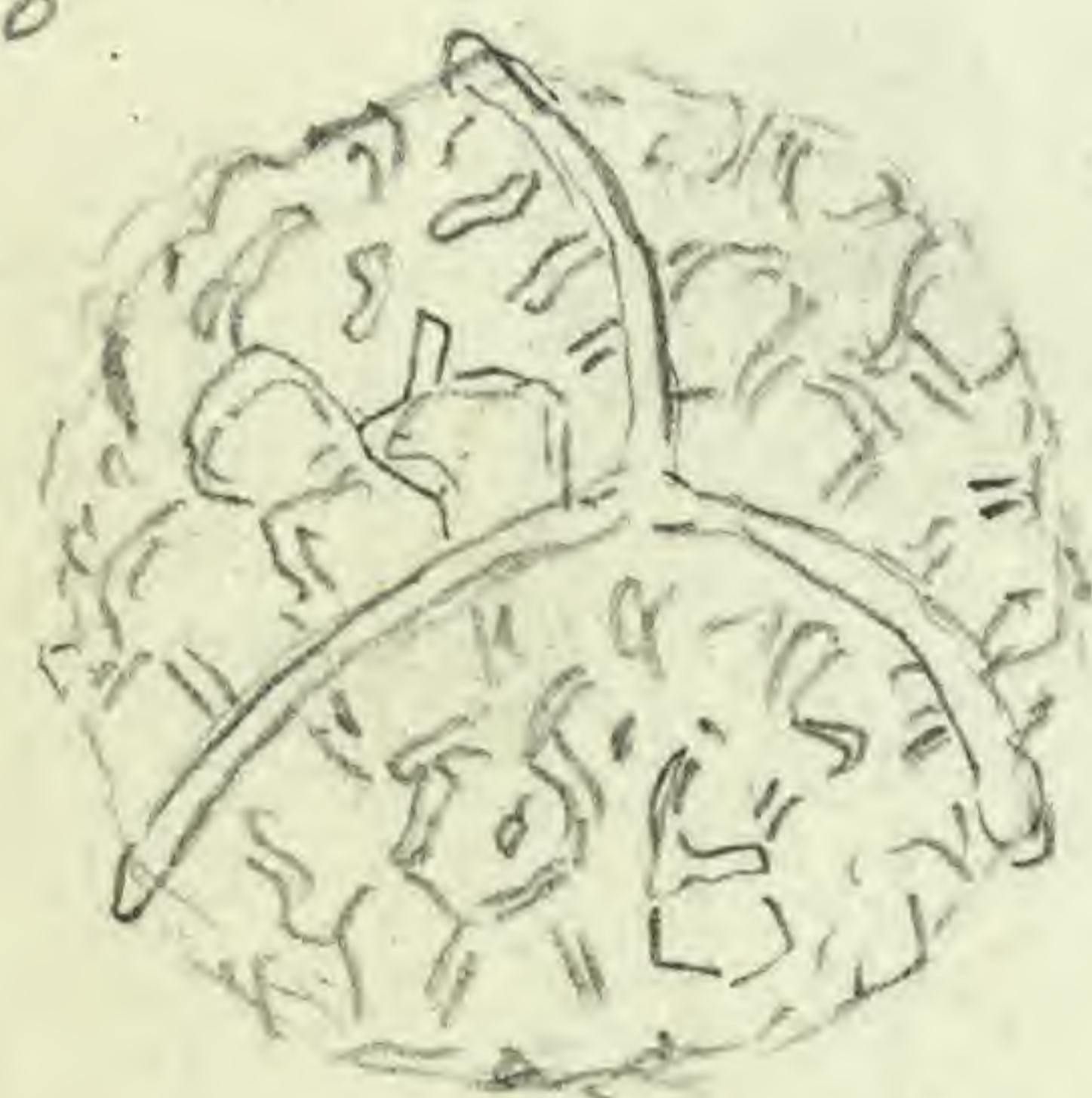
MISSOURI  
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GARDEN

*Scoetes valida*

Sept 29 1866



x60



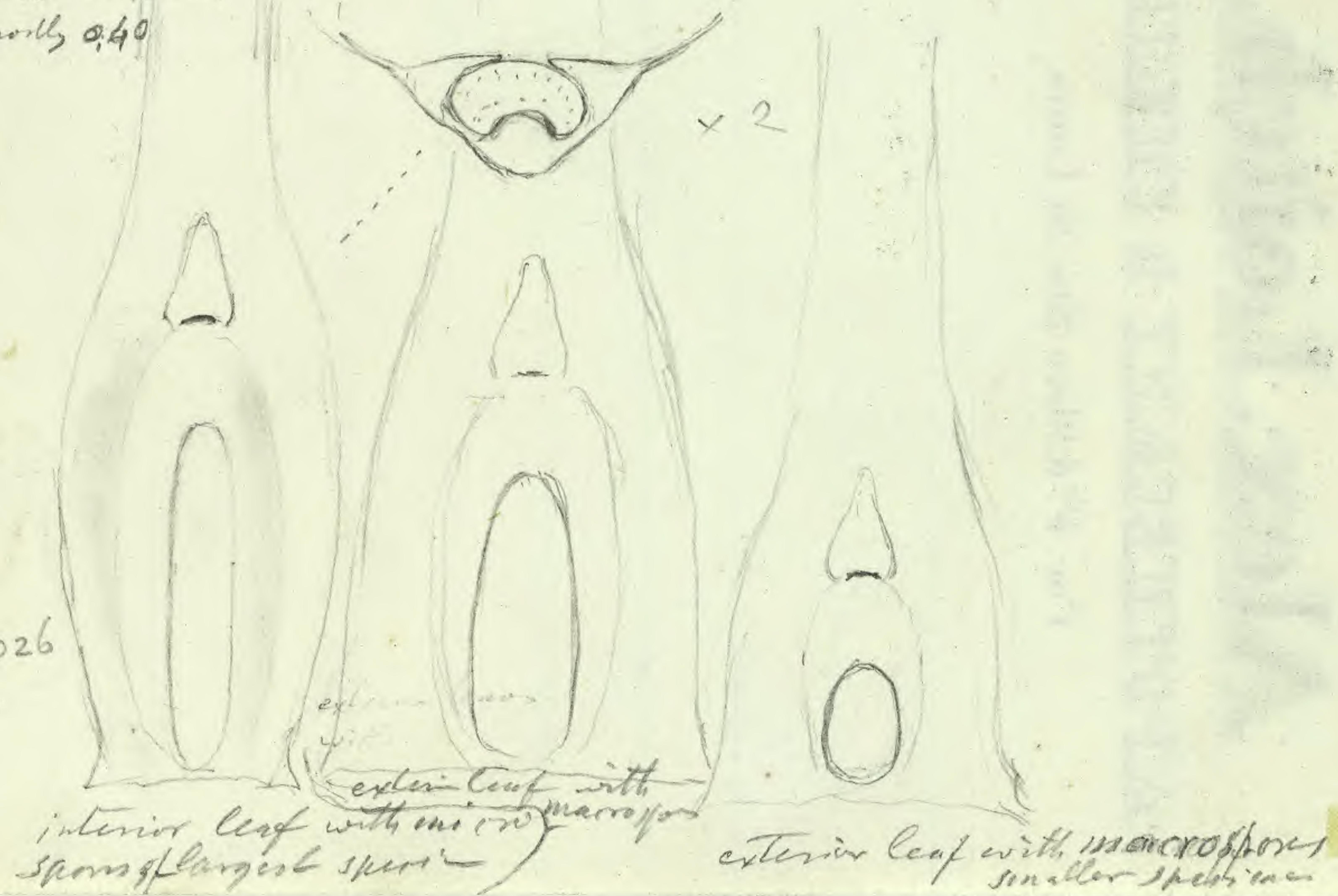
angles prominent

19-28.5 mostly 24  
60 60  
= 0.32-0.48 mm  
mostly 0.40



x415

0.025-0.027, mostly 0.026  
mm.



0 1 2 3 4 5 6 7 8 9 10  
cm

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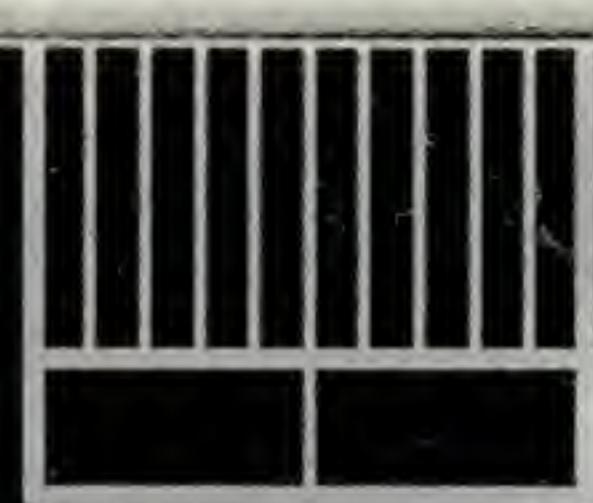
MISSOURI  
BOTANICAL  
GARDEN

13822

ALEX. LEITCH,

APOTHECARY & CHEMIST,

Cor. 4<sup>th</sup> & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

*Isoetes valida*

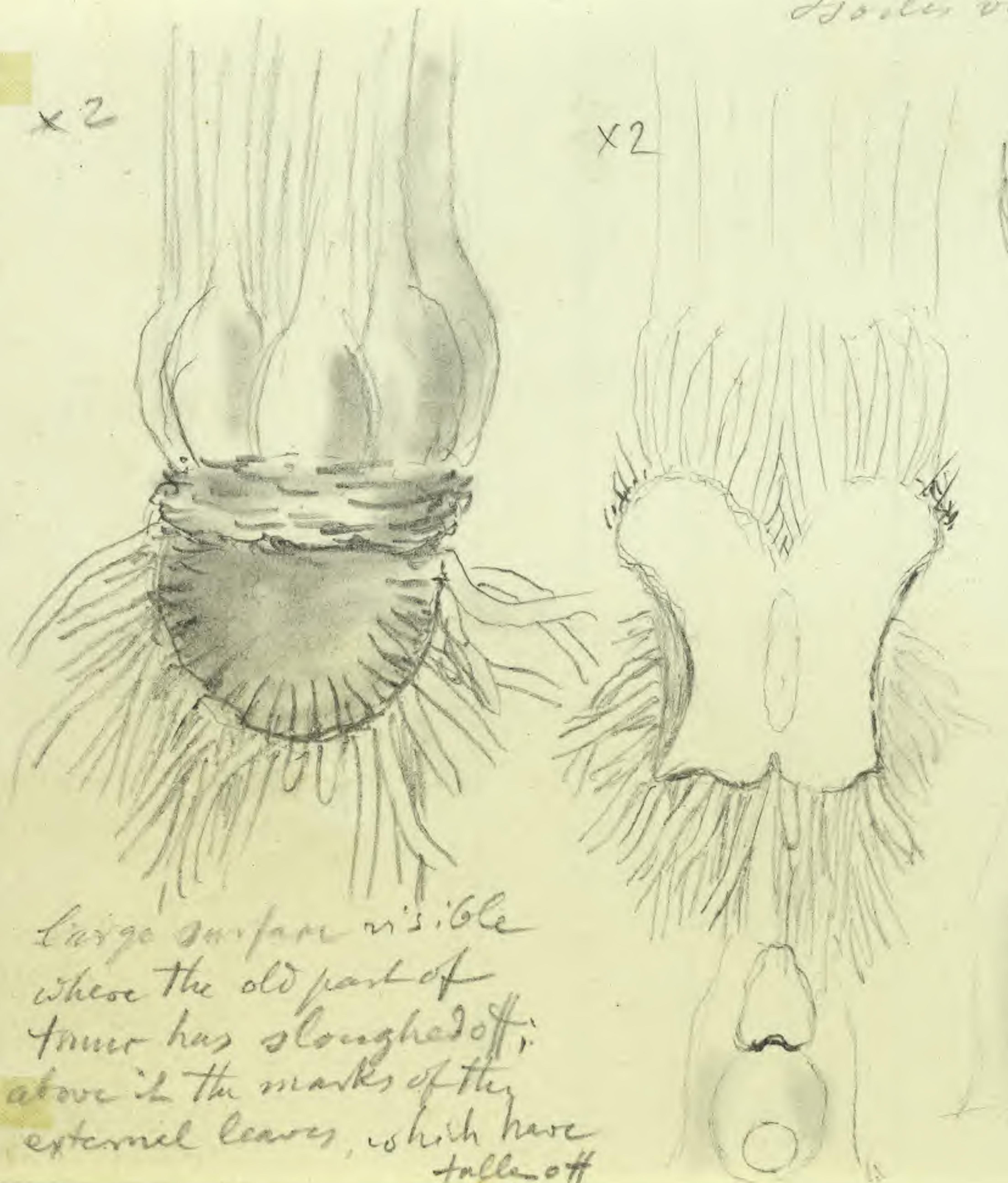
Oct. 6 1866

Damonster, Pa

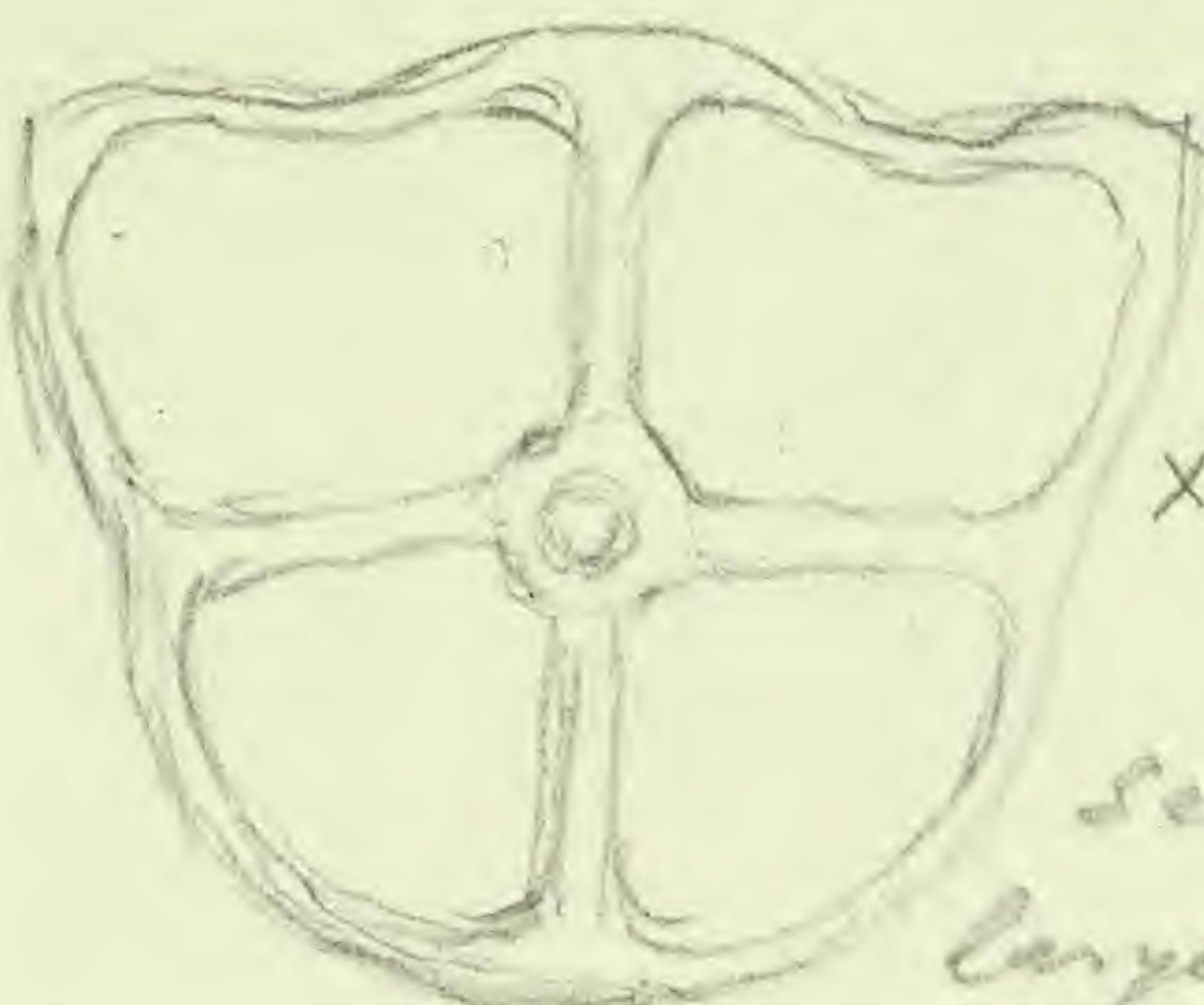
H. C. Porter Oct 1<sup>st</sup>

x2

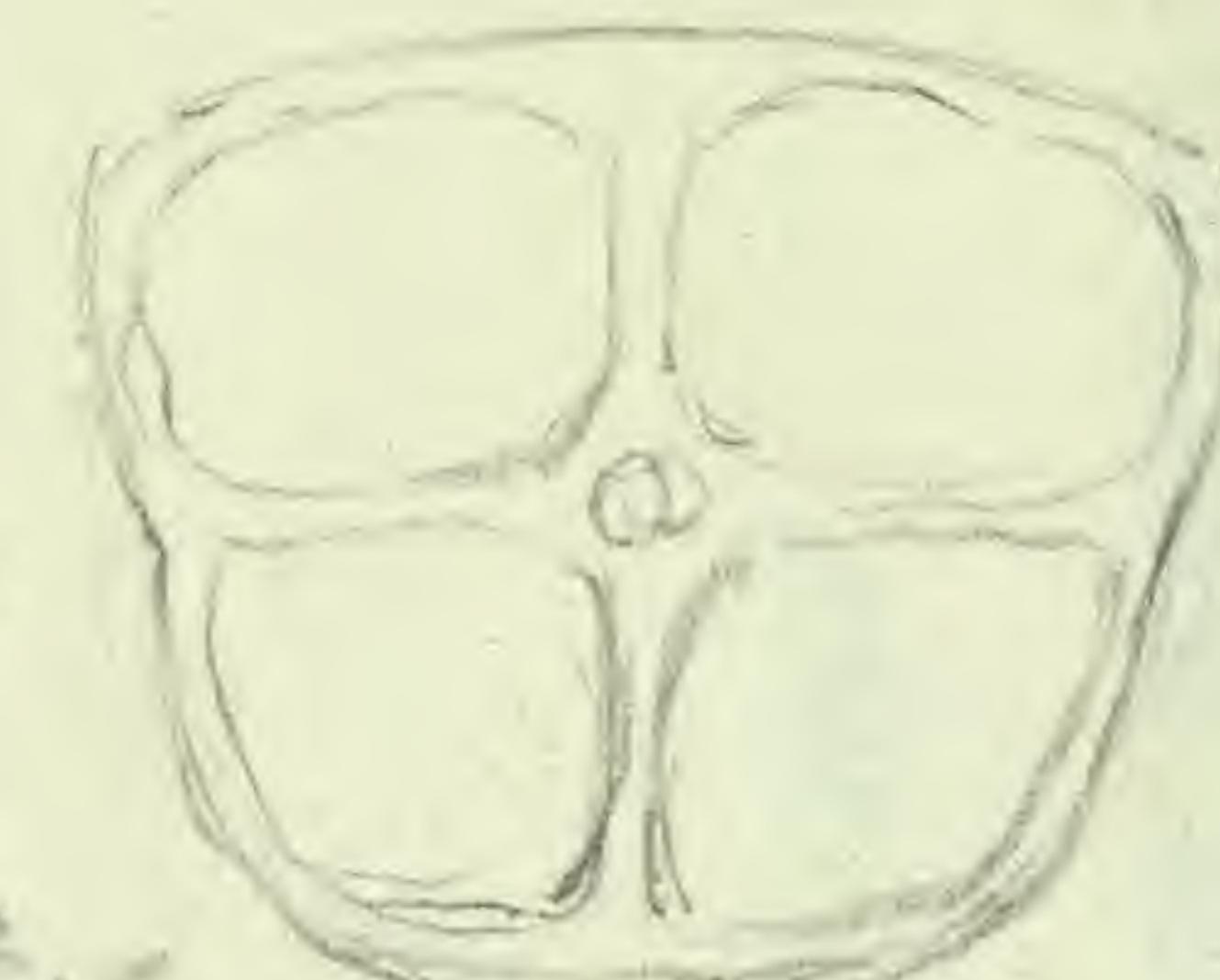
x2



Large surface visible  
where the old part of  
stems has sloughed off;  
above are the marks of the  
external leaves, which have  
fallen off



sect of a  
larger



smaller inner leaf  
stomata on upper & lower surface

x2

1411  $\frac{22-26}{60}$  = 0.37-0.43  
Diam of spores mm



x15

0.024-0.029 mm



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

13823

**ALEX. LEITCH,**

**APOTHECARY & CHEMIST,**

Cor. 4<sup>th</sup> & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

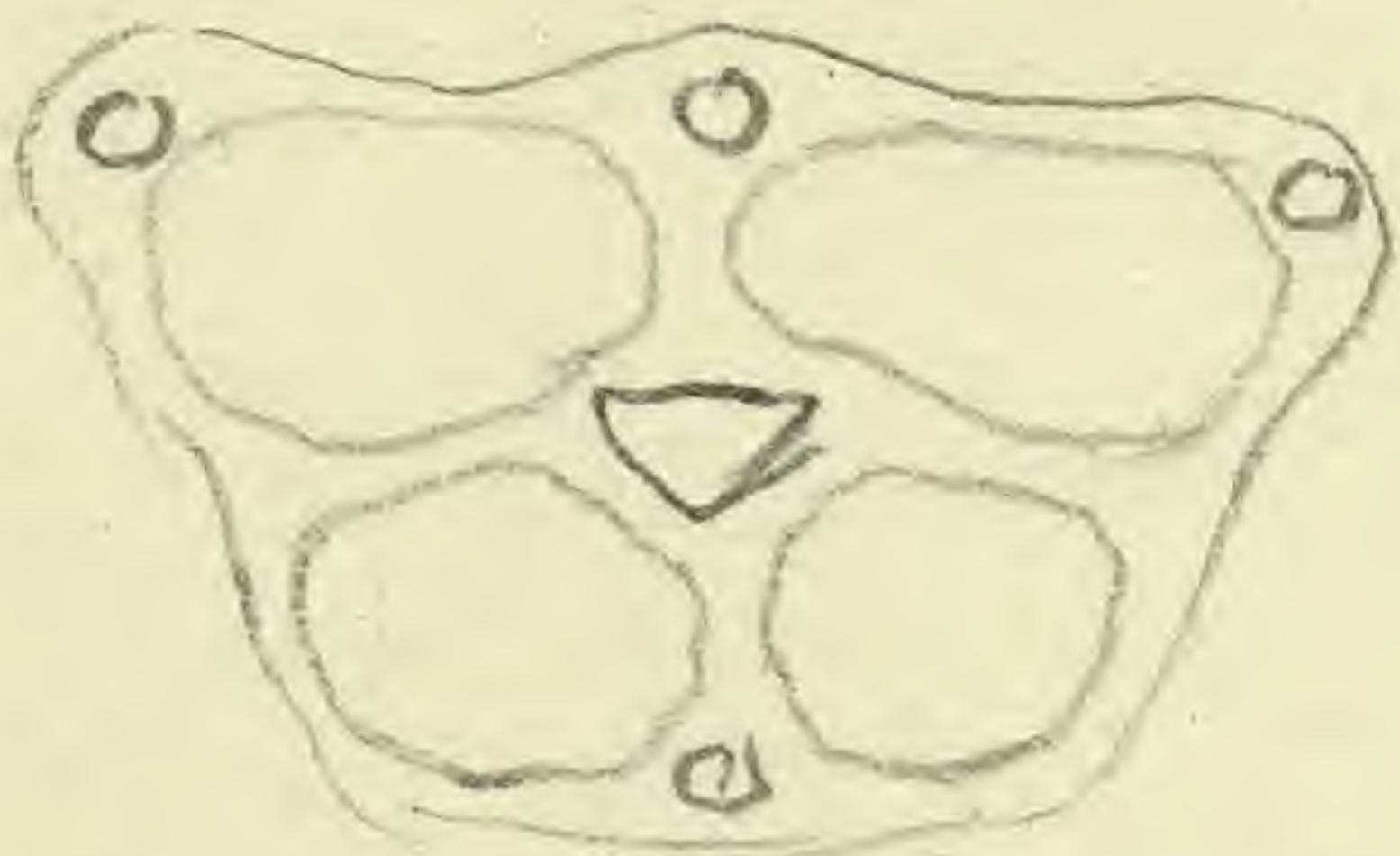
cm

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BOTANICAL  
GARDEN

*Portulaca vulgaris* & *Leguminosae* April 14 1867



Dry leaf soaked, section  
treated with Gaudich  
potash - 4 perin-  
ipheral bundles  
very plain



section of a delicate  
winter grown fresh leaf  
no peripheral last  
bundle



0 1 2 3 4 5 6 7 8 9 10  
cm

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MISSOURI  
BOTANICAL  
GARDEN

13824

**K. J. Heitger**  
**CARRY & CLEMENTS**

th. & Olive Sts. St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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GARDEN

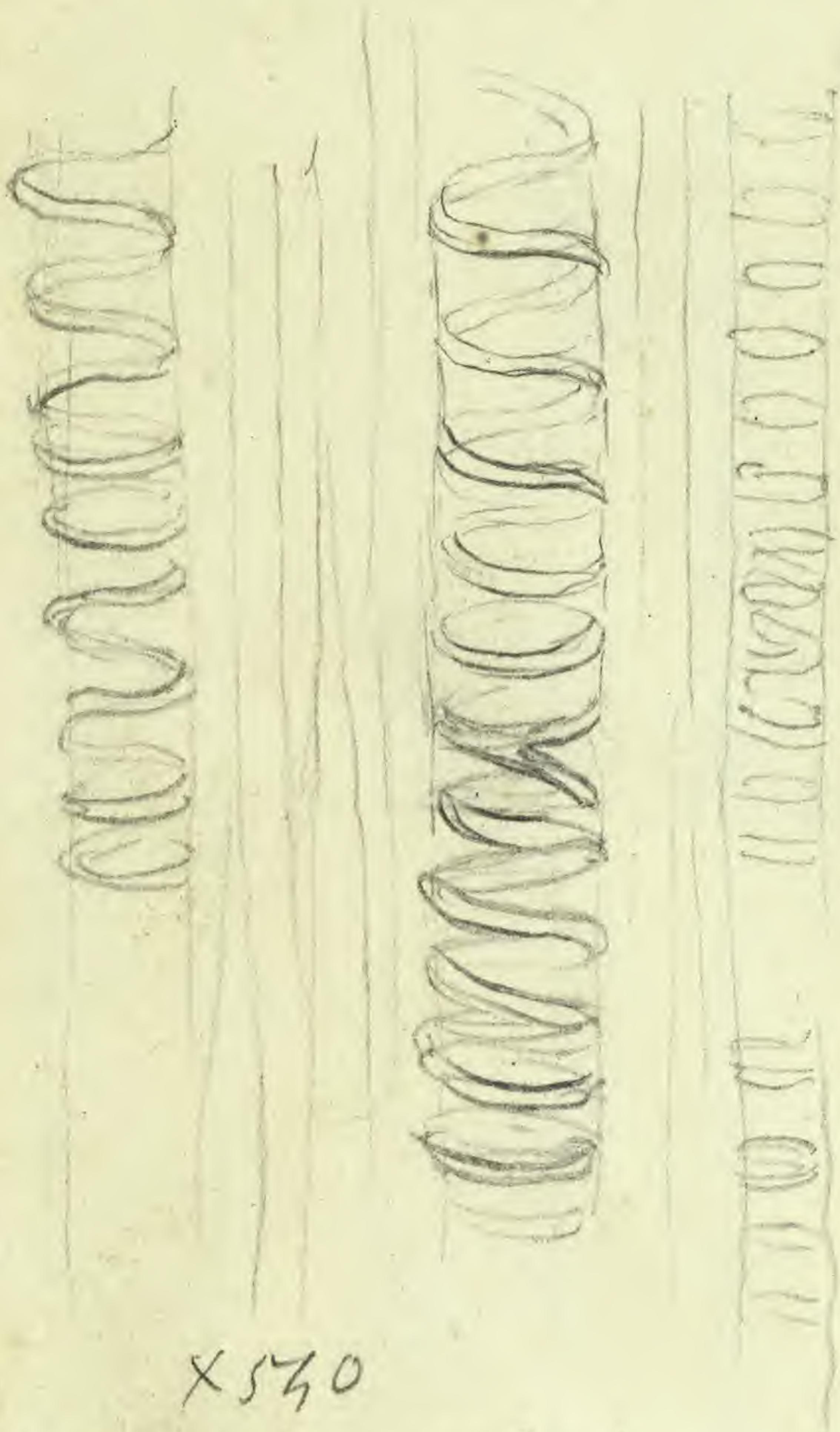


4 peripheral bast bundles

Doctor's valve

Carly 1866

April 25 1867



Special vessels &  
bast cells from the  
central bundle.

which I have not seen in other species, yes, in *Euglossa*

Examination of a leaf 40 centimeters  
long, for stomata.

1, the lower 8 or 9 centimeters pale, no stomata  
2, 10 - 12 centimeters from base green, stomata  
very sparing;

3, 20 centimeters from base stomata abundant

4, 30 - - - - - abundant

5, 40 - - - - - abundant

Stomata only partially distributed, in series, over  
the air tubes, none on great part of the surface



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

13825

**ANEX. Veitch**

**APOTHECARY & CHEMIST.**

Cor. 4th & Olive Sts., St. Louis.



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

*Isoetes Engelmanni* June 17 1867  
var *valida*, sed vdo angustis

x2

new locality, small pond  
near W. C. Wright Del

Jun 13 1867

W. H. Cramby



Spores small and soft yet -  
scarce marked - old parts of  
frankle in larger specimens has  
all fallen off - in small ones  
all decayed, but still adhering

transverse development of leaf a little  
thinner than vertical one, form of  
2-4, latter of 4-5 layers of cells



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

13826

**ALEX. LETTCH.**  
**APOTHECARY & PHARMACEUTIST**

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0 1 2 3 4 5 6 7 8 9 10

cm

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MISSOURI  
BOTANICAL  
GARDEN

*Boletus Engelmanii*

Sept 7 1867

*var validia* from Delaware 066

Cult at Miss

Diam of spores

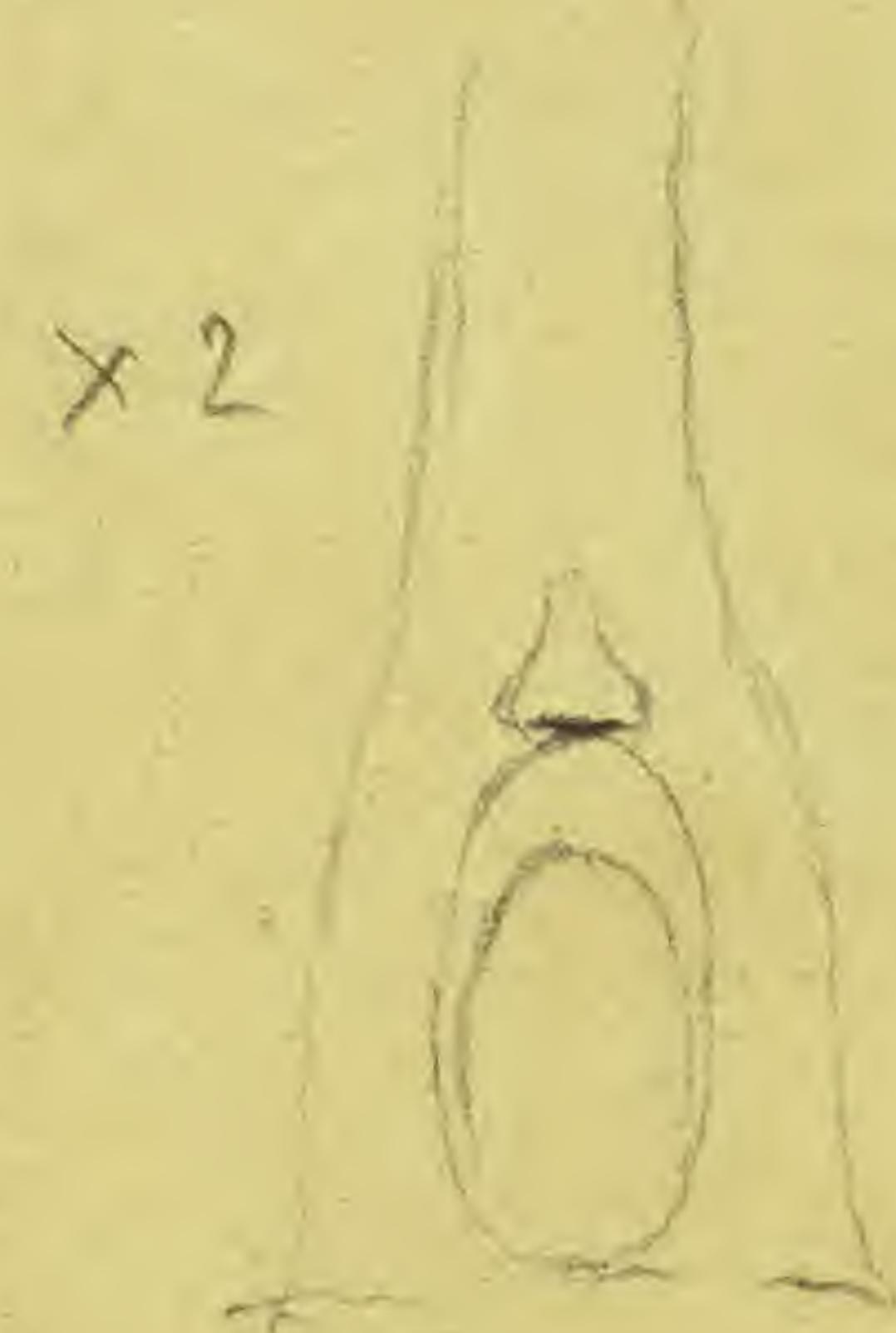


$$\frac{21.5-25.5}{60} = 0.36 - 0.42 \text{ mm}$$

Spores very strongly reticulated



$$\frac{10.5-12}{41.5} = 0.025 - 0.029$$



0 1 2 3 4 5 6 7 8 9 10

cm

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BOTANICAL  
GARDEN

13827

ALEX. LEITCH,  
APOTHECARY & PHARMACEUTIST,  
Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.



0

1

2

3

4

5

6

7

8

9

10

cm

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*Isoetes tayloriana* ? Nov 3 1866

yearlings or of last year?

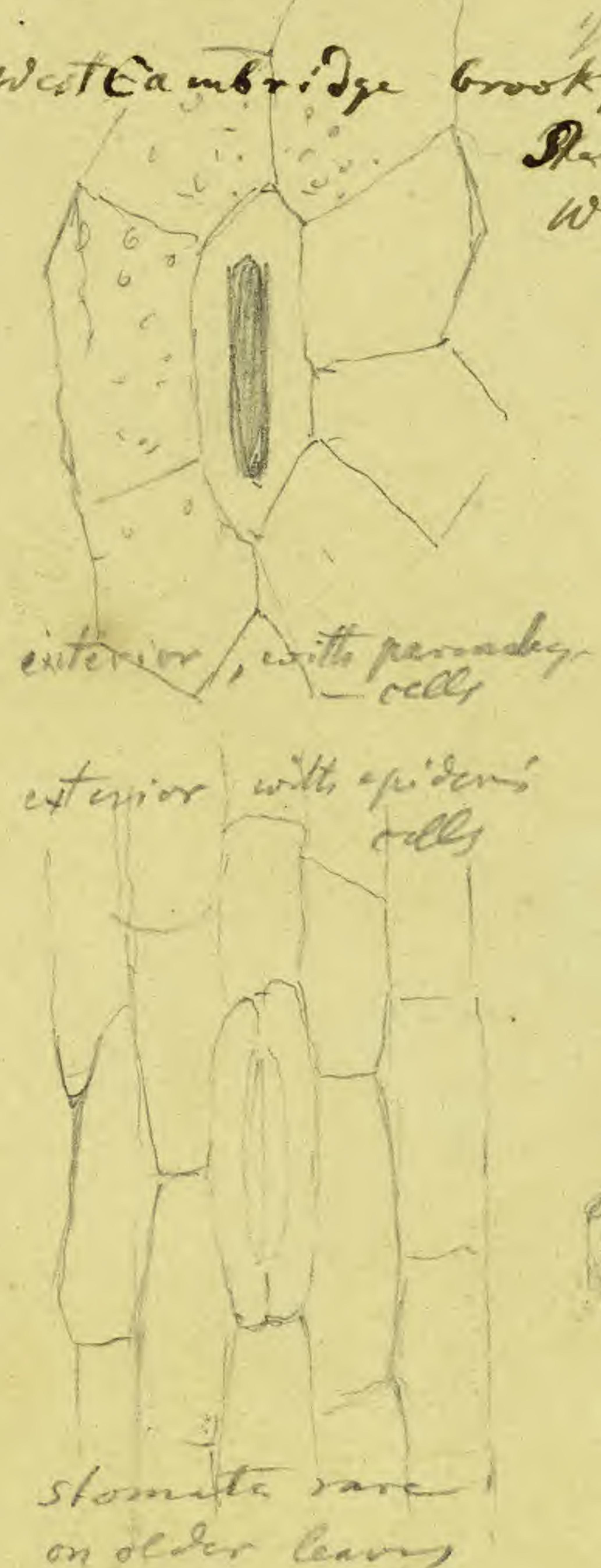
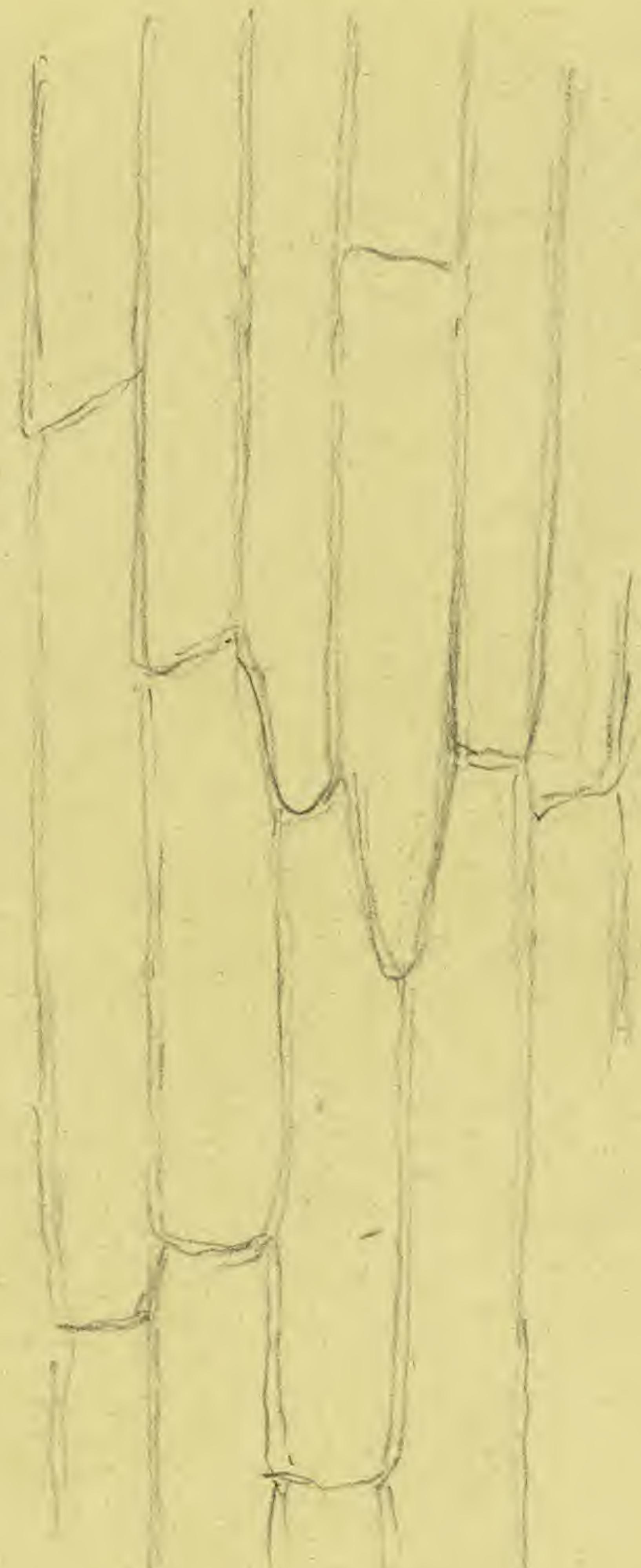
West Cambridge brook, below the millpond

Station 6

ponds 5-8 $\frac{1}{2}$  inches

W. Booth Oct. 29

long, fresh green  
15-20 - sterile



interior, with paracytic  
cells

exterior with epidermis  
cells



scale of leaf

x 10



4 regular East bunches 25 67



0 1 2 3 4 5 6 7 8 9 10  
cm

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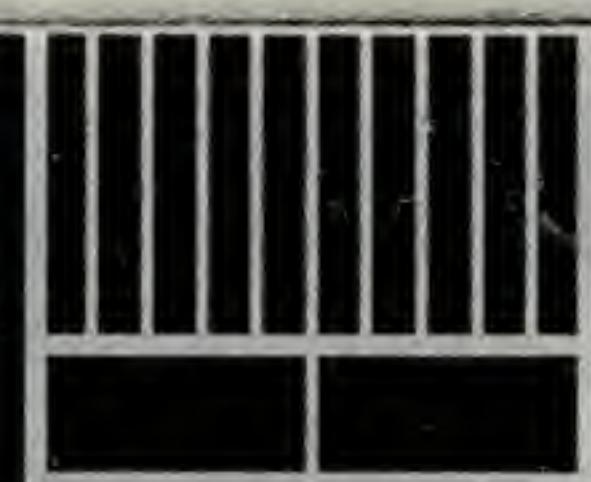


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0 1 2 3 4 5 6 7 8 9 10

cm

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*Isoetes valida*

Ditches near the Wilmington and Bellmore  
Railroad, near Stanton Station, 6 miles  
SW of Wilmington.

Leaves 20 to 25 inches long.



0 1 2 3 4 5 6 7 8 9 10

cm

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0 1 2 3 4 5 6 7 8 9 10

cm

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